SOLTON

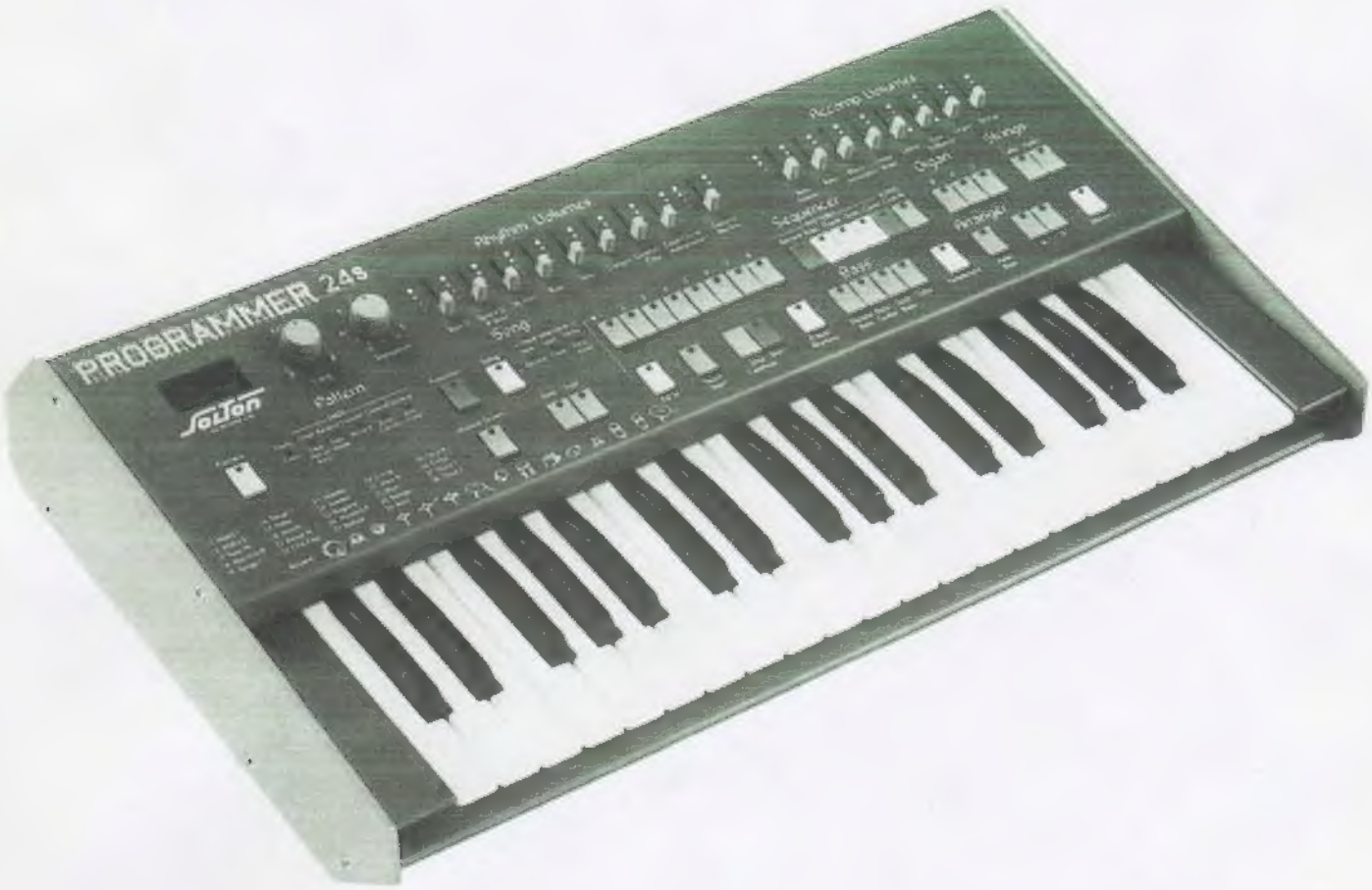
by KETRON Lab.

PROGRAMMER 24S

INSTRUCTION MANUAL

INTRODUCTION

Congratulations for having chosen this instrument.
Programmer 24S has been developed with the most up-to-date technology which allows you to reach a new extreme in sound fidelity plus an incredible variety in performance.
This is the ideal complement for the solo player for live performances, studio recording or private home entertaining.
Thanks to the many MIDI functions at your disposal, Programmer 24S is an incredibly versatile instrument, able to be adapted to the most different musical situations, including digital multitrace MIDI recording with a personal computer. We are sure that this instrument will be able to stimulate your creativity and to become a valuable means for making more and more progress in the world of music.

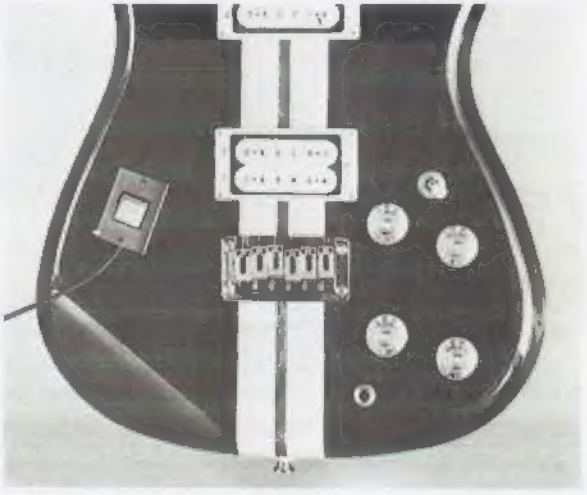


SPECIFICATIONS

37 key keyboard
15 PCM PERCUSSIVE INSTRUMENTS. Accent. 8 Percussive sections with 8 separate volume controls. General volume control.
24 PRESET RHYTHMS. Preset Rhythm On/Off. Rhythm operating functions: Start/Stop, Touch Start, Stop Continue, Slow-Fast Tempo control.
FILL IN: 24 preselected Fill In variations activated by manual (or pedal) switch.
MANUAL DRUMS: 16 keys of the keyboard are provided for Drum programming and live playing.
DISPLAY: Digital indications of all the Programmer 24S functions: Tempo, Pattern, Song, Preset Rhythm, MIDI, Tape Interface.
PATTERN: Up to 64 Patterns available. Programming functions are: Clear, Time-Number of Bars, Record, Error Correct, Instrument Clear. Programming mode: Real Time - Step by Step.
SONG: Up to 63 Songs (Chains of Patterns or Preset Rhythms). Up to 89 Patterns are assignable to each of the 63 Songs. Song functions: Record, Clear, Fill In Mode.
SONG FILL IN MODE: Up to 8 different Fill In measures assignable to a single Pattern or Preset Rhythm.
ARRANGER: 48 Arrangements divided in 2 groups: A and B. Accompaniment sections: Piano, Guitar, Brass, Accordion, Banjo, Clarinet, Flute, Synt. Separate volume controls for each section. Auto Bass and Memory functions.
BASS: Double Bass, Bass Guitar, Synt. Bass, Tuba. 3 operating functions: Auto Bass, Manual Bass, Pedal Bass. Sustain and volume controls.
PATTERN SEQUENCER: 2 track monophonic Sequencer. Free programming of Bass and Piano (or Synt) solo lines. Up to 1200 notes (approx.) available on each track. Real Time or Step by Step programming.
SONG CHORD SEQUENCER: 1 track polyphonic sequencer. Up to 4000 notes availables. Chords or harmonies may be programmed in Real Time to form a complete Song. The Status of the various Accompaniment controls may be memorized together with the Chord sequence.
ORGAN: 3 Flute voices: 8', 4', 2'. Volume control.
STRINGS: Cello, Violin. Volume control.
TUNE: General Pitch control
TRANSPOSER: 1 Octave key transposer for the whole Automatic Accompaniment
VOLUME PEDAL: General Volume control
FOOTSWITCHES: 4 Switches on the Volume Pedal. Left switches: Minor and Minor 7th Chords; Right switches: 7th Chords and Start/Stop.
TAPE INTERFACE: Save. Load. Verify. Identification of the single Save operation.
MIDI: In, Out, Thru. Midi functions: Clock, Omni On/Off, Receive, Transmit, Channel, Octave. Separate MIDI Transmission/Reception for Keys, Bass, Soloist

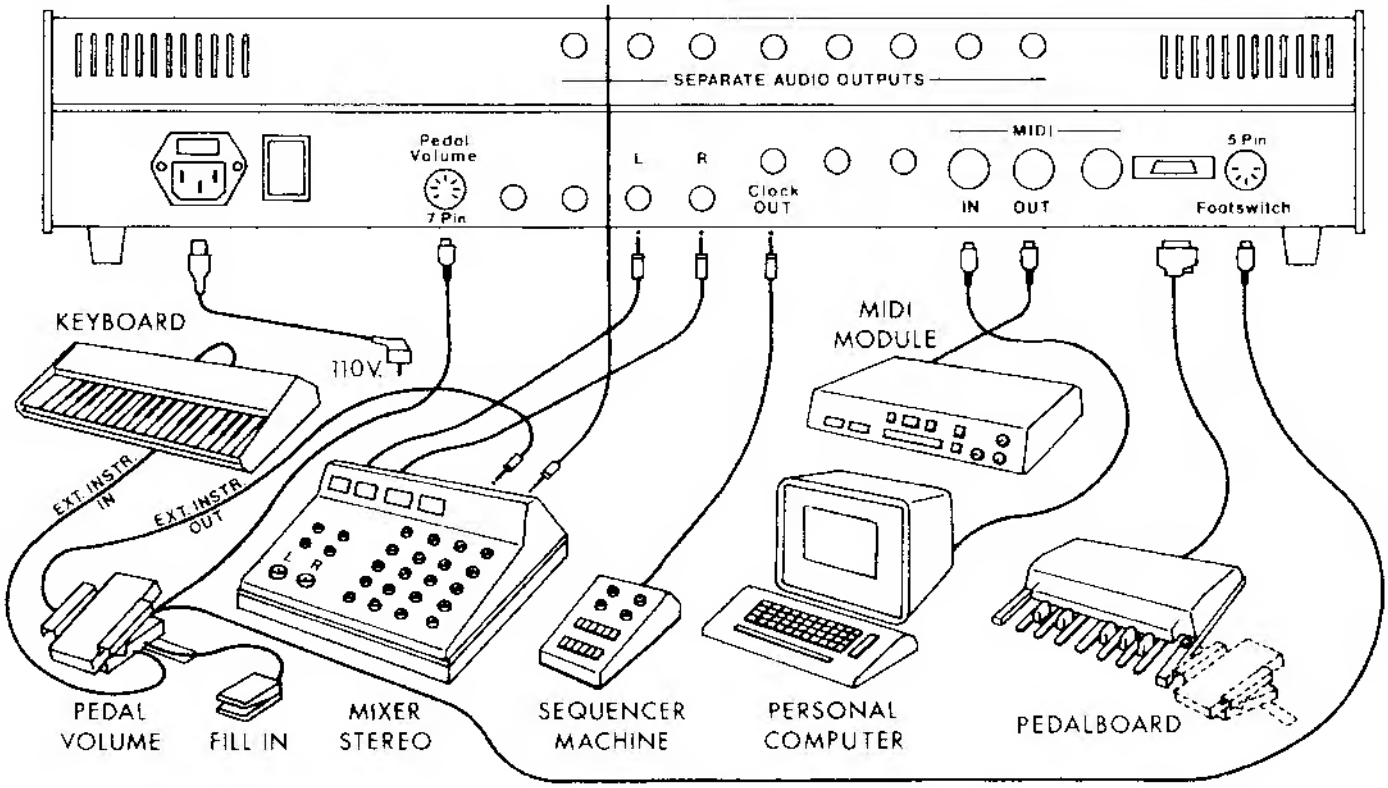


Complete accessory set.



Manual Fill In switch.

CONNECTIONS: 2 General stereo outputs: Left (Mono) and Right. Max. Output level: OdBm. Separate Bass and Rhythm Outputs. 8 separate outputs for the single percussion instrument. Volume pedal socket (7 pin). Footswitch socket (5 pin). Clock Out (24 pulses per quarter note - TTL compatible). Tape Interface terminal: Save-Load. Pedalboard socket. Input/Output jacks (on the volume pedal) for external Instruments. Input jack (on the volume pedal) for the Fill In Manual (or Pedal) switch.
STANDARD ACCESSORIES: Keyboard bag, Volume Pedal Bag, Plastic cover for the keyboard, Manual Fill In switch.
OPTIONAL ACCESSORIES: Stand, Bag for stand, Pedal Fill In switch, Pedalboard 13 notes, Pedalboard Bag.
POWER SUPPLY: 110 V - 50 Hz
DIMENSIONS: (W x H x D) 60 x 13 x 36 cms.



CONNECTIONS-OUTPUTS

The back panel of Programmer 24S is provided with an infinite number of jacks permitting the instrument to be connected for any kind of professional use.

AUDIO OUTPUTS: General L/R. General stereo amplification outputs for the complete instrument. If no stereo amplification is available, use the output "L" (Mono).

BASS-RHYTHM: Separate outputs for Bass and Rhythm. Separate audio control and tone settings are possible on these two sections.

SEPARATE RHYTHM OUTPUTS: 8 separate outputs for the 8 percussive rhythm sections. These outputs are of the utmost importance in the cases of multi-channel recording or professional amplification with external effects (echo, reverb etc.).

The instruments connected to the separate outputs are automatically excluded from the two general audio outputs (L/R) and from the Rhythm output.

PEDAL VOLUME (7 Pin): socket for expression Pedal. It controls the total volume of the Programmer 24S.

FOOTSWITCH (5 Pin): socket for the pedal control of the following functions: Start/Stop of the Rhythm-Chord Tonality selection (m, m 7th, 7 th, Diminished, Augmented Chords).

CLOCK OUT: Trigger output for synchronizing external units without MIDI. The output provides for 24 clocks each quarter (ex.: 1 4/4-measure - 96 clocks).

TAPE INTERFACE: Save-Load. Connection jacks for transferring the contents of the internal ram of Programmer 24S (Pattern/Song) onto or from cassettes.

MIDI IN, OUT, THRU: MIDI device for connection to other MIDI instruments or to a personal computer. The different MIDI possibilities and functions are described in the chapters MIDI FUNCTIONS and MIDI APPLICATIONS of this manual.

PEDALBOARD: Jack for Pedalboard connection (optional). The pedalboard may be used by guitar, piano, accordion and wind instruments players.

ATTENTION: We suggest that you connect the Pedalboard to the Programmer 24S before switching on the unit.

(See the Pedalboard functions on the page 5)

EXT. INSTRUMENT CONNECTION: The volume pedal includes an Input/Output jack to allow controlling of external instrument and to disconnect Programmer 24S from Volume control.

Cymbal, Cowbell, Clave, Conga 1, Conga 2, Crash Cymbal, Accent.
The instruments are divided in 8 percussive sections with 8 separate slider volume controls, one general rhythm volume control, 8 separate audio outputs.

MANUAL DRUMS

The Manual Drums switch is foreseen for manual rhythm or programming. In order to play manually the percussive instruments available, just insert Manual Drums and touch the first 16 keys of the keyboard.
Each instrument is characterized by a graphic symbol.
The use of keys instead of normal pushbuttons permit a higher executing speed when programming.
The Manual Drums switch will not become operative if Record is inserted on the Sequencer section.
ACCENT: In order to put the accent on a certain beat just press the Accent key with the instrument desired.

PRESET RHYTHMS

24 preset rhythms are available on Programmer 24S: Waltz 1, Waltz 2, Slow Waltz, Tango 1, Tango 2, Polka, March, March 6/8, Bossa Nova, Beguine, Samba, Mambo, Cha Cha, Ballad, Swing, Slow Rock, Blues, Beat, Hard Rock, Funky, Boogie, Disco 1, Disco 2.
In order to play one of the preset rhythms, follow this procedure:

1) Push PRESET RHYTHMS switch so light is on.
2) Select the number of the rhythm required using the push-button panel 1-8. (None above 38)
   The available preset rhythms are indicated on the left side of the instrument. The number of the rhythm chosen appears on the DISPLAY preceded by a Point. (Example: .11).
3) Press START. The rhythm starts working.
   Whenever START is pressed, the rhythm starts exactly from the beginning of the measure. In the mean time AUTO BASS and MEMORY tabs come ON.

TOUCH START: If Touch Start is inserted, Rhythm and Accompaniment start only after playing a key on the keyboard or on the pedalboard, in case the latter is connected.
Touch Start is not operative while a Song is playing and when Memory tab is On.
If you press Stop while Touch Start is On, the Memory function goes automatically Off.

STOP CONTINUE: By the control STOP CONTINUE the rhythm may be interrupted and started again exactly on the point where it has been stopped, instead of starting again from the beginning of the measure.

FILL IN: Each one of the 24 preset rhythms has its own Fill In. The Fill In is activated by manual switch (pedal switch is also available).
The Fill In occurs on the same beat in the Preset or in the Pattern at which it is pushed. The Fill In can operate in 2 ways:

A) Fill In in switch is held down. In this case the Fill In loops continuosly until the switch is released.
B) Fill In switch is released. In this case the Fill In will be over on the first beat of the following measure.

All the Preset Fill In's ends with a Crash cymbal blow.
When the Rhythm is stopped, the Fill In switch works as manual Crash Cymbal + Bass Drum.
Fill In starts always from the first measure of the Pattern, even if an 8 measure Fill In has been written (Fill In Mode function).
If the Fill In switch is pushed and pushed again 2 or more times (max. 8 times) you will get successively 2 or more Fill In measures.

SLOW-FAST: Regulating these controls, the rhythm speed may be adjusted. Tempo valve appears on the Display for 1 second a bout.
The speed range available is 30-252 beats in a minute. The "beats per minute" are the pulses supplied by the metronome within one minute on a standard pattern (i.e. one 4/4-measure with Error Correct 16).

PROGRAM CHANGE: If you change the number of the Pattern (or Preset or Song) when Start is On, the new number will appear on the Display only when the preceding Pattern (or Preset or Song) is expired. If you change the number of the Pattern (or Preset or Song) when Start is Off, the new number will immediately appear on the Display.

ARRANGER

In order to have the complete accompaniment section operating, use the following procedure:

1) Insert PRESET RHYTHMS and select the rhythm
2) Press START. Adjust Tempo (Slow-Fast)

7) Adjust rhythm and accompaniment volume as you prefer.

Each of the 24 Preset rhythms is provided with 2 arrangements particularly made to fit the characteristics of the rhythm.

The arrangements are composed of different instrument sections: Bass, Piano, Guitar, Accordion, Brass, Clarinet, Flute, Banjo, Synt.

The different instrument sections are provided with separate volume controls. For the Synt effect a Brilliance Control is provided to create particular timbres.

A-B: Controls for selecting the two types of arrangement.

BASS: For the Bass 4 effects are available (Double Bass, Bass Guitar, Synt. Bass, Tuba), also three different operating modes: Automatic, Manual, Pedalboard.

AUTO-BASS: Automatic Bass with already programmed harmonic lines and chord recognition.

The chord may be played in any of its main inversions, and its basic note will be recognized by the Bass. If the pedalboard is connected, the Bass recognizes the note played on the pedalboard as the basic one, independently from the chord played by the left hand on the keyboard.

In this way complex and elaborate harmonizations may be obtained.

MANUAL BASS: When Auto Bass is not inserted, the Bass works in manual mode on the complete keyboard (or on the Pedalboard).

PEDALBOARD: This control transfers the Arranger function to the Pedalboard (optional). In this way, by pressing a key of the pedalboard, the complete Automatic Accompaniment plus Organ and Strings can be obtained.

The use of the pedalboard will be of particular interest to the guitar and piano player, but also to the wind instrument player, due to the fact that it allows him to excercise and to play solo in public with the support of a stimulating rhythm section.

TONALITY PEDAL SWITCHES m, m 7th, 7th: Musicians who use the Pedalboard can use these 3 switches situated on the Volume Pedal to obtain Minor, Minor Seventh, Seventh, Diminished and Augmented Chords.

Diminished Chords are obtained by pressing both Minor and Minor 7th switches.

Augmented Chords are obtained by pressing both Minor 7th and 7th switches.

ORGAN-STRINGS: The accompaniment is provided with an Organ section with three flute voices (8', 4', 2') and a Strings section (Cello, Violin). Both sections have separate volume controls. In the case of pedalboard connection the two sections are automatically transferred on the pedalboard by the Pedalboard control.

MEMORY: Memory for the complete Programmer 24S accompaniment. The memory is automatically disconnected by the pedal switch Stop.

TUNE: General tuning control for the instrument. With reference to the central position (440 Hz or Diapason), the maximum variation amounts to a semitone towards the bass (*b*) or towards the treble (#).

TRANSPOSER: Complete transposition of one octave for the Accompaniment. Each step of the transposer corrisponds to exactly one semitone.In position C Programmer 24S is tuned on the Diapason basis.

When the Transposer is turned to the positions B, A and G the lowest notes of the Bass are automatically raised to the higher octave. Transposer function is not operative on MIDI.

PATTERN

The Programmer 24S can store in its internal memory up to 64 Patterns at standard Pattern values (Time: 1.4.4; Error Correct: 16).

A single Pattern can be up to a maximum of 16 Bars (Time: 8.8.4).

The Pattern programming includes Rhythm, Bass and Piano sequences.

Programming functions are: Clear, Time - No. of Bars, Record, Error Correct, Instrument Clear.

Two programming mode are availables: Real Time and Step by Step.

To insert PATTERN follow this operation:

1) Push PATTERN.
2) If PRESET rhythm is ON, switch it OFF.
3) If SONG is on, press PRESET rhythm twice to reach the only PATTERN function.

REAL TIME RHYTHM PROGRAMMING

This mode is the most immediate one, as the rhythm may be programmed by simply playing the 16 keys of the keyboard.

In order to insert the programming function, carry out the following steps:

3) Press repeatedly PATTERN until reaching RECORD.
RECORD stands for programming.
4) Press START. The metronome beats the quarters of the measure.
Adjust the tempo by means of the controls Slow-Fast. If the metronome is not audible, make sure that the potentiometer for Clave-Metronome is turned up.
5) Press MANUAL DRUMS. It is now possible to start rhythm programming by pressing the keys on the keyboard that correspond to the percussive instruments requested.
IMPORTANT: The first percussive pulse programmed will be considered as the beginning of the measure, or Reset. (Lights Flash, Double Click).
6) If the rhythm programming is correct, press repeatedly PATTERN until only the pattern switch is lit.
If there are any errors in the programming carried out, you may cancel it with the feature Clear- and repeat it.
7) To Clear, push Pattern until Clear lights up, then push Function.

NOTES

A) The length of a Standard Pattern is one 4/4-measure with Error Correct 16. For selecting different values of musical division or for carrying out corrections, see the chapters TIME- No. OF BARS and ERROR CORRECT.
B) In position RECORD, new pulses are accepted continuously by the memory, for each one of the 8 percussive sections, however, only one pulse at a time can be programmed.
If more pulses of the same section are programmed on the same step, they will cancel each other.
Example: On a single step only one of the three Hi-Hat effects available can be programmed.
C) PATTERN PROGRAMMING WITH PRESET RHYTHMS
The Pattern may be programmed also on a Preset rhythm. The Max. Lenght available for the Pattern is the same of the Preset. In this case, however, take care to program the first pulse in the beginning of the bar, since it will be this pulse that determines the beginning of the measure. (Down beat lights flash, double click is heard). As a matter of fact, if the first pulse is programmed in the middle of the bar, you will have the unpleasant surprise to have the PATTERN out of time compared to the Preset Rhythm. Afterwards, if the first pulse at the beginning of the measure is not required, you may easily cancel it.
D) FULL. This word appears on the Display whenever the section Pattern (or Song) is completely filled up.
In this condition it will not be possible to carry out new programming, unless some of the already existing Patterns (or Songs) are cancelled.
E) ACCENT. For programming the Accent on a certain point of the Rhythm just press Accent on the point requested. The Accent functions on all the instruments programmed on the same point of the Rhythm.

CLEAR

Pattern cancelling. In order to cancel a Pattern you do not wish to keep, proceed in the following way:
1) Insert PATTERN
2) Press again PATTERN (Clear lights up)
3) Press FUNCTION (Clear will be switched off). The memory is now cancelled and Pattern returns to the starting condition.

TIME-NUMBER OF BARS

This function will allow you to determine the number of Bars by wich the Pattern is constituted and the musical division of the single bar. The first figure on the Display shows the number of Bars (from 1 to 8). The 2nd and the 3rd figure on the Display shows the Time signature of each bar.
For programming these values proceed in the following way:
1) Insert Pattern
2) Press Pattern twice (Time lights up). Whenever the Pattern is clear, on the Display appears 1.4.4., that is 1 Bar 4/4. This is the standard Time value of the Pattern.
3) The number of Bars (1st Display's figure) can be changed by selecting the desired value on the push-button panel 1-8.
4) The Time Signature value can be programmed as follows:
A) The 2nd figure of the Display can be selected by pressing the Slow-Fast buttons (Numbers from 1 to 8 availables).

division:
2.2.4. = 2 Bars 2/4; 4.3.4. = 4 Bars 3/4; 8.4.4. = 8 Bars 4/4;
4.5.4. = 4 Bars 5/4; 2.6.8. = 2 Bars 6/8; 4.7.8. = 4 Bars 7/8.
The longest Pattern available is the value 8.8.4., wich corresponds in practice to a 16 Bar Pattern.

6) To memorize the desired value simply press Pattern and proceede to the other functions.

ERROR CORRECT

During Real Time programming, Error Correct allows those percussive pulses that have been programmed slightly out of time to be automatically corrected.
Error Correct of standard Patterns is 16, that means that in the Pattern a maximum of 16 pulses per measure (or sixteenths) can be accepted (for each one of the 8 percussive sections available). Let's see some examples.
With Error Correct 4, the instrument accepts only 4 pulses (or notes) on the Pattern (even if many more are programmed). This kind of Error Correct may be useful for programming the Bass Drum in Disco rhythms.
On the other hand the Error Correct 32 may be used for programming subtle Hi Hat variations in jazz or funky rhythms.
It is possible to choose a different Error Correct value for each one of the percussive instruments, f.e. E04 for Bass Drum, E08 for Snare Drum, E32 for Hi Hat.
Error Correct has to be selected before starting the Pattern programming. Some practical experience is requested for choosing the best Error Correct for each Pattern.
We therefore suggest to use the two PATTERN CHARTS enclosed to this operating manual.
For selecting the Error Correct values, carry out the following steps:

1) Press repeatedly PATTERN until reaching ERROR CORRECT
2) Select the required Error Correct value on the pushbutton panel 1 - 8.
   8 different values are available:
   E04 - E08 - E12 - E16 - E24 - E32 - E48 - E96
3) Press PATTERN in order to record the chosen value. Press 2 times PATTERN in order to go back to the starting position.

INSTRUMENT CLEAR

This feature permits single percussive instruments to be cancelled from programmed Patterns, without having to cancel the complete Pattern.
For carrying out Instrument Clear, you have to:

1) Press several times PATTERN until obtaining INSTR. CLEAR (on the Display the Pattern number will appear).
2) Insert MANUAL DRUMS.
3) Insert START and press the key on the keyboard that refers to the instrument to be cancelled. If the key is pressed for the complete Pattern length, the instrument will be completely cancelled from the Pattern.
4) Press PATTERN in order to go back to the starting condition.

STEP BY STEP RHYTHM PROGRAMMING

For STEP BY STEP (note by note) Rhythm programming, the following steps have to be carried out:

1) Insert PATTERN (adjust Time and Error Correct values as desired).
2) Press PATTERN three times (STEP MODE lights up)
3) Press START. 001 appears on the Display.
   If a different number appears on the Display, press STOP CONTINUE and then again START, until obtaining 001.
4) Press MANUAL DRUMS
5) Press the keys corresponding to the percussive instruments you wish to program on the first step of the Pattern.
6) Press FUNCTION. The instruments are now stored on step 001, and you ear the sonds programmed on the previous step.
7) Go on programming repeating points 5 and 6 until the complete Pattern is filled in (i.e. until step 016 in the case of a standard Pattern). The programming may be continuously up-dated.
   In order to program a blank step, just press FUNCTION without playing any key on the keyboard.
   Step by Step programming can be more easyly made with the help of a preprogrammed Chart. See the Pattern Charts of this manual.

1) **PATTERN SEQUENCER:** 2 track monophonic which allows the programmability of the Bass and Piano (or Synt). (Piano and Synt voices can't play together). Up to 1200 notes available for each track. These 2 sequencer lines can be memorized on each of the 64 Patterns following the normal Pattern functions. Bass and Piano programs may be programmed in Real Time or Step by Step.
2) **SONG SEQUENCER:** 1 track polyphonic sequencer (7 notes) for Chord programming or harmonizing.
   The Song-Chords Sequencer programming can be made through the Song functions in Real Time, upon an existing Rhythm chain.
   All informations regarding the Chord Sequencer are examined on the chapter Song-Chord Sequencer in the Page n. ...

PATTERN SEQUENCER

BASS and PIANO REAL TIME PROGRAMMING

For Real Time Programming of the Bass and Piano Sequences, carry out the following steps:
1) Press PATTERN and select the Pattern number required.
2) Press several times PATTERN until obtaining RECORD.
3) Press START. The Metronome starts beating (or Rhythm, if it has been programmed).
4) On the Sequencer Section the controls BASS or PIANO (SYNT) have to be inserted, according to the sequence you wish to program.
5) Insert RECORD on the Sequencer section (if RECORD does not light up, make sure that Manual Drums and MEMORY is not inserted).
6) Play the required BASS or PIANO (SYNT) notes on the keyboard or in the Pedalboard. (In case of Bass programming one of the four Bass effects have to be inserted; in case of piano programming piano must be on).
   The pressed notes will be immediately replayed by the Sequencer in the same way as they have been recorded.
   IMPORTANT: If Record, Bass and If Record, Bass and Piano are on, Piano (or Synt) sequence can be played hearing the bass line already programmed.
7) **SEQUENCE CLEAR.** This function permits to cancel eventually existing errors in the Bass or in the Piano Sequence.
   To make any Clear operation follow this procedure:

A) Make sure that Pattern and Sequencer are in RECORD position
B) Press Bass or Piano or both (according if you want to Clear the Bass, the Piano or both)
C) Press Start
D) Press Clear. Clear has to be left inserted in the Sequencer section during the complete Pattern length.
   Then switch off Clear and repeat the Sequence programming.

NOTES

1) If the Sequence is programmed with Metronome only, the first note played will be accepted as first beat of the Pattern.
2) If the Sequencer is programmed together with an existing Rhythm Pattern or with a Preset the length of the sequence will be the same as the length of the guiding Preset Pattern.
3) The programmed sequence may sound with the Arranger, but in this case the Bass and the Solo lines of the Arranger will be replaced by the Sequencer lines.
4) Sequencer programming can be made on all 37 keys and in any key.
   However, if you want the sequences to follow the chords you play on the Programmer 24S IT IS NECESSARY to program the sequences in C tonality (Key of C major).

BASS AND PIANO STEP BY STEP PROGRAMMING

This system is particularly suitable for programming more elaborate sequences, or at any rate sequences that cannot be carried out on the keyboard in real time.
The phases of note by note programming are similar to the ones already described in the Rhythm Chapter:
1) Insert PATTERN (adjust Time and Error Correct values as desired)
2) Press PATTERN three times (STEP MODE lights up).
3) Press START. On the Display 001 appears. If a different number appears, first press STOP CONTINUE and then START until obtaining 001 on the Display.

... Bass not light up, make sure that MEMORY or MANUAL DRUMS are not inserted).
6) Play the first Bass or Piano (Synt) note that is supposed to be programmed.
7) Press FUNCTION. The played note is thus recorded on step 001. On the Display 002 appears.
8) Continue programming by repeating the points 6 and 7 until the Pattern end (i.e. until step 016 in the case of standard Patterns).
   For programming blank steps, just press FUNCTION without playing any of the notes on the keyboard.

NOTE: For Step by Step programming any of the available TIME or ERROR CORRECT values may be selected (See chapter TIME and ERROR CORRECT).
For these features we suggest to use the PATTERN CHARTS enclosed to these operating instructions.
As a matter of fact, you will find that note by note programming is easier to be operated with the help of a table where the complete Pattern to be recorded has been written before.

BASS AND PIANO SEQUENCES PLAYBACK

In order to obtain the playback of the two programmed sequences (Real Time or Step by Step mode) the following steps have to be carried out on the sequencer section:
1) Insert PATTERN
2) Insert BASS and PIANO (or SYNT). Insert one of the four Bass effects.
3) Press START.
4) Play any of the keys on the keyboard. If the key is changed, the sequencer will automatically follow the new tonality.

SONG

A Song is defined as a group of Patterns (or Preset Rhythms or both) connected among each other like a chain, such as to form a complete piece of music with Rhythm, Bass, Lead line and Chords.
63 Songs are available. One Song can be formed by a maximum of 89 Patterns (or Presets or both).
The Song memory can store up to 5.600 Rhythm Patterns.
Song programming must be made following two different operations:
1) First a Song Chain has to be written, which includes Rhythm and Pattern Sequencer (Bass and Piano).
2) When the Song Chain is ready, a Chord Sequence can be played on the keyboard in Real Time to complete the Song.

Let us examine first how it is possible to Record a Song Chain.

SONG RECORD

In order to program a Song Chain carry out the following steps:
1) Press SONG (Pattern will contemporarily lights)
2) Select the required Song number by the push button panel 1-8. This number will appear on the Display preceded by the letter C (standing for Chain) (Example: C11) Attention: The Song number doesn't change when Song Chords tab is On.
3) Press again SONG. Record lights up. On the Display appears the number "1".
   If the Song is already programmed on the Display appears the number 1 followed by the first Pattern of the Chain (Example: 1.11)
4) Select the number of the first Pattern or Preset to be in the Chain. If both Pattern and Preset have to be memorized press Preset.
   If only Preset has to be memorized disconnect Pattern.
   The choosen number appears on the Display.
5) Ajust the Tempo speed as desired (See Tempo Change Programming).
6) Press Function. Number 2 appears on the Display. Thus the first Pattern of the Chain has been programmed.
7) In order to add other Patterns or Presets in the Chain repeat the steps indicated in the points 4 and 6.
   On reaching the 10th Pattern of the Chain, n. 1 will light up on the push button panel 1-8 (The Display lights 0).
   On reaching the 20th Pattern n. 1 and 2 will light up on the panel 1-8 (The Display lights 0).
   On reaching the 30th Pattern, n. 1, 2 and 3 will light up on the panel 1-8 (Display)).
   And so on until reaching eventually the last Pattern that is number 88.

END: Include as the last Pattern of the Chain a blank Pattern. Song will go automatically out from the Recording function and will return to the starting position.
In this way the Song will always Stop as soon as the Chain is terminated.

NOTES: If you wish to include Silent Pattern in a Song, you should program such Pattern with Accent pulses only. Song 88 is not available for Programming.
Each Pattern programmed in a Song Chain includes automatically the Pattern Sequencer (that is Bass and Piano) eventually programmed on this Pattern.
Whenevev the Song's RAM is completely filled up, **FULL** word appears on the Display. In this condition, to carry out new Songs, it is necessary to Clear some existing Songs.

TEMPO CHANGE PROGRAMMING

This function allows programming of the Tempo speed of each Pattern (or Preset) choosen to be in the Song. After selected the number of the first Pattern or Preset, adjust the Tempo speed as desired by the Slow-Fast buttons.
The Tempo value appears on the Display for 1 sec. about. In order to verify by earing the Tempo it is necessary to go out from Song functions.
The Tempo speed of the Pattern is recorded whenever FUNCTION is pressed (in RECORD position).

SONG CLEAR

This feature permits to cancel a programmed Song chain.
The following steps have to be carried out:
1) Press SONG and select the number of the Song to be cancelled.
2) Press SONG twice to reach Clear function. (Clear lights up)
3) Press FUNCTION. Song is now cancelled and automatically returns to the starting position.

SONG - FILL IN MODE

This feature makes it possible to use SONG for linking together several Patterns that are programmed as Fill In. These Patterns can include rhythm, bass and piano (or synt.) sequences.
The practical advantage of this feature consists in the fact that it is possible to have up to 8 different Fill Ins available for a single Preset Rhythm or Pattern.
For producing a Fill In chain proceed in the following way:
1) Insert SONG and select the number of the Song to be programmed. The Song number has to be the same as the number of the Preset rhythm or the Pattern for wich the Fill In chain is supposed to be programmed.
2) Press three times SONG until obtaining FILL IN MODE. On the Display will appear 1.11.
3) Select the number of the first Pattern to be put in chain.
4) Press FUNCTION. The Pattern is now recorded. The number 2.11 appears on the Display.
5) In order to insert other Patterns (i.e. nr. 2, 3, 4 etc.) repeat points 3 and 4 until having completed the required series.
6) At the end of the chain press SONG in order to get out from the feature FILL IN MODE.

In order to get operative the Fill In chain programmed in the above way, use the following procedure:
1) Insert PRESET RHYTHMS (or PATTERN) and select the number for wich the fill in song has been made.
2) Press FILL IN
3) Select the required Fill In number on the push-button panel 1 ÷ 8.
4) Press START
5) The Fill In feature becomes operative by pushing on the manual break switch (or Pedal)

In order to disconnect the FILL IN Chain device:
1) Disconnect the Fill In number selected on the 1 ÷ 8 push-button panel.
2) . Switch off the Fill In control.

SONG CHORD SEQUENCER

This section of the Sequencer allows programming of 1 track polyphonic sequence such chords or harmonizations.
A maximum of 7 notes can be played at one time. Up to 4000 notes are available in the Sequence.
Song Chord Sequence can be programmed only on already existing Song Chains. Programming is made in Real Time. In order to memorize a Chord Sequence follow these operations:

3) Press SONG CHORDS on the Sequencer section.
4) Press any voice on the Organ and Strings sections. Such Organ or Strings voices must be necessa rily On on each Chord Sequence programming.
5) Press Bass and Piano (if they have been programmed in the Pattern) and choose one of the 4 Bass effects.
6) Press Arranger A or B (if Preset Rhythm has been programmed and if Arranger is desired).
   Note that one Song can be formed exclusively with Preset Rhythms and Arranger. In this case to have a complete background of a Song it is enough to program only the Chord Sequence (Bass will be automatically programmed with the Arranger).
7) Play on the keyboard, or on the Pedalboard, the first chord of the Song (if you like that the Song starts with a Chord).
8) Press START. The Song starts playing. From this moment on, any chord or any harmonization played on the keyboard, or on the Pedalboard, is recorded.
   Furthermore any modification apported to the "status" of the various Accompaniment controls will be immediately recorded. (See PROGRAMMING the STATUS OF the ACCOMPANIMENT).
9) When the Song Chain ends, the Record function goes Off and the Chord Programming stops. Song returns to the starting position.
   If the Song was programmed with a LOOP at the end of the Chain, (See song record) the Chord Sequence programming stops exactly in the Loop point.

If the Chord Sequence is programmed upon an ending Song (No Loop), when the Chord Sequence is terminated the Song function stops on Record position.

CAUTION

1) If on the Song are programmed both Pattern Sequencer and Preset Rhythm, the Preset prevails over the Pattern (that is the Pattern Sequencer follows the chords played on the keyboard).
2) Any Fill In included on a written Song (by Fill In Mode function) must have the same Time value as the correspondent Pattern of the Song. If this value is different, to press Fill In can cause problems to the Chord Sequence of the Song.

PROGRAMMING THE STATUS OF THE ACCOMPANIMENT

The Song Chords Sequence function allows also to program the general "Status" of the various Accompaniment controls.
Before to start playing the Chord Sequence but also whilst the Song plays , it is possible to adjust all the Accompaniment tab controls (that is Sequencer, Organ, Strings, Bass and Arranger) in the desired way and this "status" will be recorded into the Song exactly as selected.

CHORD SEQUENCE PLAYBACK

In order to obtain the playback of the programmed Chord Sequence (that is the playback of the entire Song) carry out the following steps:
1) Press SONG and select the required Song number.
   CAUTION: When Song Chords tab is On, The Program Change doesn't work. If you push the buttons 1-8, instead of Program Change you will get the number of the Fill In referred to the same Song (See SONG FILL IN MODE).
   In this case, to select the right Song number, it is necessary to diconnect first the Fill In number and then disconnect Song Chords tab.
2) Press SONG CHORDS.
3) Press START. The complete Song will start playing.

CHORD SEQUENCE CLEAR

In order to Clear a complete Chord Sequence follow these operations:
1) Press SONG
2) Press SONG twice to reach Clear (Clear lights up)
3) Press SONG CHORDS
4) Press FUNCTION. The Chord Sequence is now cancelled. Song returns to the starting position.

MIDI (Musical Instrument Digital Interface) is based on the transmission/reception of digital information referring to two or more instruments connected among each other.
The transmission is provided for by a standard digital interface, with three external DIN jacks (5 pin):
IN, OUT, THRU.
For connecting use 5-pin MIDI-cable, length not more than 50 feet.
The MIDI-functions foreseen on the Programmer 24S are:
CLOCK, OMNI, RECEIVE, TRANSMIT, CHANNEL, OCTAVE.

CLOCK

MIDI-synchronization control for Rhythm and Automatic Accompaniment of Programmer 24S. Let's go through the different steps:

1) Insert PATTERN
2) Press FUNCTION. CLOCK lights up. 0 appears on the Display. (When switching on the instrument, the Clock value is always 0)
3) On pressing several times FUNCTION, the numbers 0, 1 and 2 appear one after the other on the Display.
   Position 0: Programmer 24S neither trasmits nor receives MIDI synchronization messages and works with its internal clock only.
   Position 1: The rhythm section of the instrument is synchronized with the clock of an external MIDI item (f.e. a Personal Computer), and it will work only when it receives the Clock from the latter.
   Position 2: The instrument transmits its internal clock to other items connected chain-wise.
4) Once the Clock position has been chosen, press PATTERN for recording.

OMNI

The OMNI device allows you to control whether MIDI functions on all channels at the same time, or only on some of them. In order to enter the OMNI mode use the following procedure:

1) Press PATTERN
2) Press FUNCTION
3) Press PATTERN once more. ON will appear. on the Display. (When switching on the Programmer, the OMNI value is always ON).
4) Pressing repeatedly FUNCTION, ON and OFF alternate on the Display.
   Position ON: Programmer 24S receives on all the 16 MIDI-channels (Generally speaking all MIDI items are in position OMNI ON when switched on).
   Position OFF: Programmer 24S receives or transmits on certain channels only (OMNI OFF-POLY operation). This function is most important for the MIDI dialogue between Programmer 24S and other MIDI items connected, f.e. a Personal Computer (see MIDI APPLICATIONS). In the OMNI OFF (POLY) state Programmer 24S can receive different MIDI messages on different MIDI channels at the same time.
   As we will see later on, Programmer 24S foresees separate MIDI channels for 4 sections: Keys, Bass, Sequencer, Rhythm.
5) In order to record the OMNI value chosen just press PATTERN.

RECEIVE

MIDI-messages receiving state.
Programmer 24S is able to receive up to 4 MIDI messages conteporarily, addressed to up to 4 sections of the instrument:

1) KEYS. Codes of the keys pressed or released
2) BASS (Automatic, Manual or Pedalboard)
3) PIANO (SYNT) SEQUENCER or Arranger SOLOIST
4) RHYTHM.

Here is the procedure for selecting the sections to which the MIDI messages will be addressed:

1) Press PATTERN
2) Press FUNCTION
3) Press repeatedly FUNCTION until obtaining RECEIVE. On the Display the sign rc will appear.
4) Use the buttons 1, 2, 3 and 4 of the push-button panel 1-8 in order to select the respective 4 sections that you wish to include in Reception.
5) Press again PATTERN for recording these sections.

TRANSMIT

MIDI transmission feature. As we have already seen, Programmer 24S can transmit 4 MIDI messages contemporarily corresponding to 4 sections of the instrument: 1) KEYS 2) BASS 3) SEQUENCER/ SOLOIST 4) RHYTHM.
In order to select the Transmit functions, carry out the following steps:
1) Press PATTERN
2) Press FUNCTION
3) Press repeatedly PATTERN until obtaining TRANSMIT. On the display the sign Tr appears.
4) Use the controls 1, 2, 3 and 4 of the push-button panel in order to select the respective 4 sections to be transmitted (KEYS, BASS etc.)
5) Press PATTERN for programming the selected Transmit function.

NOTE: If on Programmer 24S none of the 4 indicated sections is selected for transmission, there will be no MIDI transmission at all on the Programmer.
Practically a keyboard (or a MIDI expander module) connected to the Programmer 24S on MIDI IN can sound ONLY if on the Programmer the TRANSMIT sections are selected.
Some examples of MIDI Transmission are listed in the chapter MIDI APPLICATIONS.

CHANNEL

Selection of the MIDI receiving or transmitting channel.
To each of the 4 Programmer 24S sections (Keys, Bass, Sequencer/Soloist, Rhythm) any of the 16 available channels may be assigned.
In this way each of the 4 sections is able to dialogue on a certain MIDI channel with an external unit such as MIDI Expander or Keyboard.
In order to assign a MIDI Channel to the four sections use the following procedure:
1) Press PATTERN
2) Press FUNCTION
3) Press repeatedly PATTERN until obtaining CHANNEL. Push-Button nr. 1 lights up (Keys section). (Standard position when the instrument is switched on).
4) Press repeatedly FUNCTION in order to select the MIDI Channel (1-16) to be assigned to section nr. 1 (Keys). The number of the selected channel appears on the Display.
5) Now press nr. 2 of the push-button panel (Bass).
6) Press FUNCTION in order to select the MIDI Channel to be assigned to the Bass section.
7) Go on in the same way for selecting the Midi Channel for section 3 (Sequencer/Soloist) and for section 4 (Rhythm).
8) Having assigned the MIDI Channels to the different sections, press PATTERN for getting back in the starting position.

OCTAVE

The feature MIDI OCTAVE permits the complete keyboard of the Programmer to be transposed one octave towards the lower notes. In this way a total of 4 octaves are available on the Programmer. This feature may become particularly important in the case of MIDI expanders or keyboards connected to the instrument in order to obtain very low notes, f.e. electric Bass effects.
OCTAVE is only a MIDI feature and therefore does not work on the internal sections of Programmer 24S: Bass, Organ, Strings etc.
For using this feature, use the following procedure:
1) Press PATTERN
2) Press FUNCTION
3) Press PATTERN repeatedly until obtaining OCTAVE. On the Display OFF appears. This is the standard position upon switching on the instrument.
4) Press FUNCTION. ON appears on the Display. In position Octave ON Programmer 24S transmits all the codes of the keyboard with a transposition of 1 octave towards the Bass.
5) Press PATTERN in order to get back into the initial condition.

SOLO, TRANSP are cancelled and consequently they have to be programmed again when the instrument is switched on once more. CHANNEL function remains programmed.

B) Each external MIDI unit connected on MIDI IN in receiving position to Programmer 24S can receive MIDI messages from any Programmer Section ONLY if set on OMNI OFF and if it receives on the same MIDI CHANNEL as the one corresponding to this same section on Programmer 24S.

C) When sections 2 (BASS) and 3 (PIANO) are set in Midi Receive, are excluded from internal operation.

TAPE INTERFACE

The TAPE INTERFACE has been foreseen for transferring to/from cassettes the contents of all the Patterns/Songs programmed on Programmer 24S.
There are three different Tape Interface functions: Save, Load, Verify.

SAVE

Before carrying out any SAVE operations (i.e. data transfer on cassette), make sure that the input LINE IN or MICRO on the recorder is connected to the SAVE output of Programmer 24S.
In order to carry out a correct SAVE operation, use the following procedure:

1) Press SONG
2) Press FUNCTION (Save lights up)
3) Select the eventual Identification number (see IDENTIFICATION NUMBER). If only one SAVE operation is carried out, this number will not be necessary
4) Insert the PLAY and RECORD on the recorder and press again FUNCTION
5) On the Display the letter "S" appears. This letter indicates that the SAVE operation is in course. The whole operation takes place in approximately 80 seconds.
   At the end of the operation the letter S disappears and SONG stays inserted.

IMPORTANT

During the transmission the V-meter has to stay around OdB. In some cases, if there are difficulties for recording, it may be necessary to clean or to demagnetize the heads of the recorder.
Also cassettes that are worn out too much might cause problems.
It is advisable to carry out a VERIFY operation once the SAVE operation is terminated, to make sure that the data are recorded correctly.

IDENTIFICATION NUMBER

This feature permits you to assign a number for recognition to each single SAVE operation.
The identification number is formulated by the push-button panel 1-8 and HAS TO BE SELECTED BEFORE the data are recorded (Save: point 3; Load: point 5).
Thus it is possible to store an infinite number of Patterns/Songs on a single cassette, each one easily to be recognized by means of the identification number assigned before the SAVE operation.
This feature will be most useful to those who play live for a whole evening (f.e. piano bar). The player just has to recall (through LOAD) the required programs from the recorder, selecting the respective identification number formulated for SAVE before starting the LOAD operation.

LOAD

Before starting the LOAD operation (i.e. the data transfer from Recorder to PROGRAMMER 24S) make sure that the output LINE OUT (or HEADPHONE or MONITOR) is connected to LOAD on Programmer 24S.
Please keep in mind that during LOAD the complete Pattern/Song memory of Programmer 24S is rewritten, and consequently any eventually existing program will be cancelled.
In order to obtain a correct LOAD operation, use the following procedure:

1) Insert SONG
2) Insert FUNCTION
3) Press again SONG (Load lights up)
4) Press FUNCTION. On the Display the letter "L" appears. Programmer 24S is now ready to receive the data from the cassette.
   (Should you get into this position erroneously, you can leave it by pressing any of the keys of the instrument)

At the end of the loading, the letter L disappears from the display and SONG stays inserted.
NOTE: In order to obtain the LOADING of a particular series of Patterns—Songs already stored on a certain point of the cassette by SAVE, it will be necessary to get exactly on the respective point of the cassette before starting the LOAD operation.

VERIFY

This feature has been foreseen in order to allow you to control that the data transferred by the operations SAVE or LOAD are exactly identical to the original ones.
The following procedure has to be used:

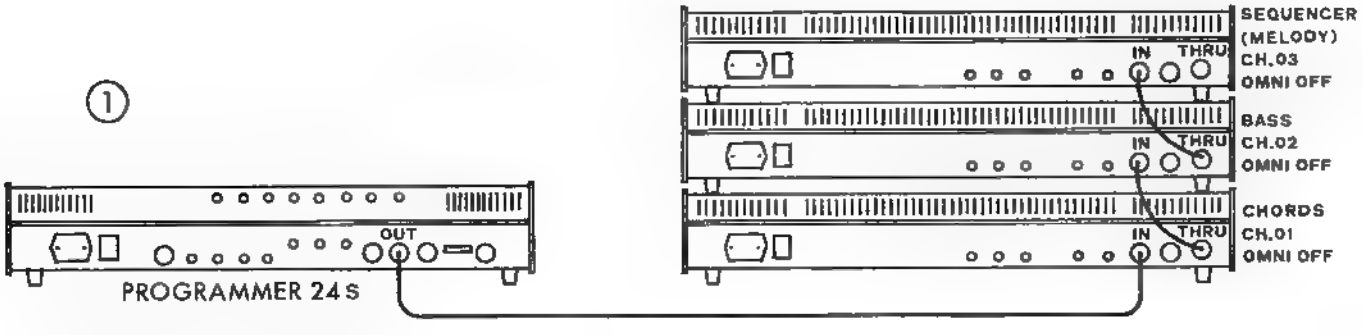
1) Press SONG
2) Press FUNCTION
3) Press repeatedly SONG until obtaining VERIFY
4) Press again FUNCTION and insert PLAY on the Recorder. On the Display the letter "U" lights off and on as long as the comparison goes on.
   If all data are correct, SONG stays inserted.
   If the data do not conform to the originl ones, "Err" appears on the Display, which stands for Error. In this case you will probably have to repeat the SAVE or LOAD operation.

CONNECTION OF PROGRAMMER 24S WITH I (OR MORE) MIDI EXPANDER MODULES

Programmer 24S may be connected to I or more MIDI expander modules (or MIDI keyboards) in order to extend and enrich its timbric possibilities.
Each one of the 3 sections of the Programmer 24S, Chords, Bass and Sequencer can transmit separate MIDI information to the same number of MIDI modules (see TRANSMIT).
The Chords are transmitted on Channel 01; the Bass on Channel 02; the Sequencer (or melody) on Channel 03. The three receiveing MIDI units have to be set on the corrisponding MIDI Channel and have to be in position OMNI OFF (see figure).
For carrying out this kind of connection, set the MIDI features of Programmer 24S in the following ways:

CLOCK : 0
OMNI : OFF
RECEIVE : —
TRANSMIT : Section 1 (Chords) — Channel 01 (or between 1 and 16)
Section 2 (Bass) — Channel 02 (or between 1 and 16)
Section 3 (Sequencer) — Channel 03 (or between 1 and 16)

OCTAVE: ON or OFF, according to the octave requested. Octave is a transmission feature only.
NOTE: The transmission of the code of the Bass notes (02) takes place in form of pulses only.
We therefore suggest to set a Bass timbre with an adeguate RELEASE (or Sustain) value, in order to avoid sounds that are too much "stopped".



to the type of computer used are needed.
By means of the Computer it will be possible to carry out (with Programmer 24S) digital recordings of musical sequences referring to Rhythm, Bass, Chords and Sequencer.
As a matter of fact, on the computer a complete repertoire of pieces of music and musical arrangements can be memorized.
These recordings are possible thanks to the separate MIDI channels belonging to the different sections: Chords (01), Bass (02), Sequencer (03), Rhythm (04). (See Transmit and Receive).
In the use of the computer, there are two different phases: RECORDING (RECORD) and PLAY.

CLOCK : 1 (if the program has its own MIDI Clock)
2 (if Clock MIDI is transmitted from Programmer 24S. In this case the output CLOCK OUT on Programmer 24S has to be connected to the input CLOCK IN on the interface)

OMNI : OFF

RECEIVE : —

TRANSMIT: Transmission of the sections Chords, Bass and Sequencer (or Melody) is always carried out on the section TRANSMIT 1.
Rhythm transmission is carried out on the section TRANSMIT 4.

OCTAVE: ON or OFF according to the octave requested.

NOTES

1) We suggest to program the first trace of the program with rhythm. The rhythm sequence may be programmed in real time, playing the keys of the Programmer (MANUAL DRUMS) or may be transferred as Preset Rhythm, Pattern or Song.
   The Rhythm sequence will supply the exact time basis which is necessary for programming the other traces.
   In the Rhythm transmission rhythmic variations, FILL IN etc. can be included.
2) The different traces have to be programmed one after the other.

RECORD

The recording functions may vary according to the personal computers and the relevant software programs used.
As for Programmer 24S the different MIDI recording functions have to be set in the following way:

PLAY

In order to play-back the sequences programmed on the different traces the MIDI RECEIVE features on Programmer 24S have to be set in the following way:

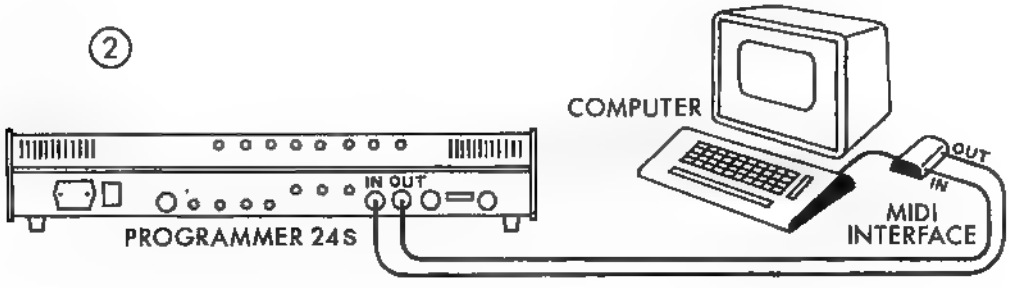
CLOCK : 0 (if the Rhythm trace has been programmed with the internal Clock of Programmer 24S).
1 (if the trace has been programmed with the Computer Clock).

OMNI : OFF

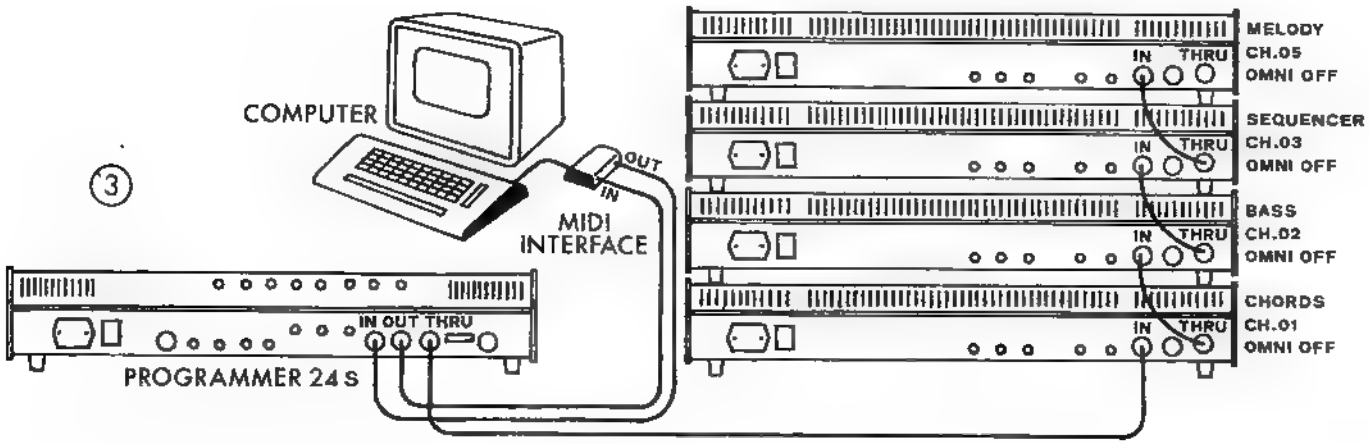
RECEIVE : 1) Chords reception. Channel: the same as the one set for transmission
2) Bass reception. Channel as above
3) Sequencer reception (or melody). Channel as above.
4) Rhythm reception. Channel as above.

TRANSMIT : —

OCTAVE : Does not work during reception.



Undoubtedly this is the most fascinating way of application, combining the advantages of the two types of application described so far.
As a matter of fact the Programmer 24S included in a MIDI chain as shown on the figure is the very center of a digital multitrace and polytimbric MIDI recording system.
The Keyboard of Programmer 24S can be used for real time playing of the different sequence traces (Bass, Chords, Melody etc.), whereas the perfect synchronisation of the Programmer, added to the ones of the connected expander modules, or also the latter ones only.
With this system it will be possible to record also very complex musical bases, which may be used for live performances, for work in the studio and for musical composition research. As for the connection and the dialogue or Programmer 24S with the MIDI units and with the Computer, the same rules as the ones described above have to be applied.



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① PATTERN CHART

PATTERN STANDARD DIAGRAM (TIME:1.4.4; ERROR CORRECT : E 16)

PATTERN NUMBER :

BEATS	1				2				3				4			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Accent																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
Bass																
Piano-Synt.																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

PLEASE COPY AND USE.

On the figure nearby the structure of a standard Pattern of PROGRAMMER 24S is shown with Time value 1.4.4. and Error Correct E16.
The most of the rhythms and of the Sequences can be programmed with these values.
Nevertheless, for the programming of some popular rhythms, different Time and Error Correct values are requested. For example:

Waltz / Jazz Waltz	:	Time	=	2.4	Error Correct	=	12
Bolero	:	»	=	4.4	»	=	24
5 /4	:	»	=	5.4	»	=	12
Polka / March / Tango	:	»	=	4.4	»	=	16
Boogie /Swing	:	»	=	4.4	»	=	12
Slow Rock / Blues	:	»	=	6.8	»	=	16
Samba / Disco	:	»	=	4.4	»	=	16
Bossa Nova / Beguine	:	»	=	4.4	»	=	16

Special rhythm variationslike Snare Rolls, Flams etc. must be programmed Step by Step with higher Error Correct values (32, 48 or 96).

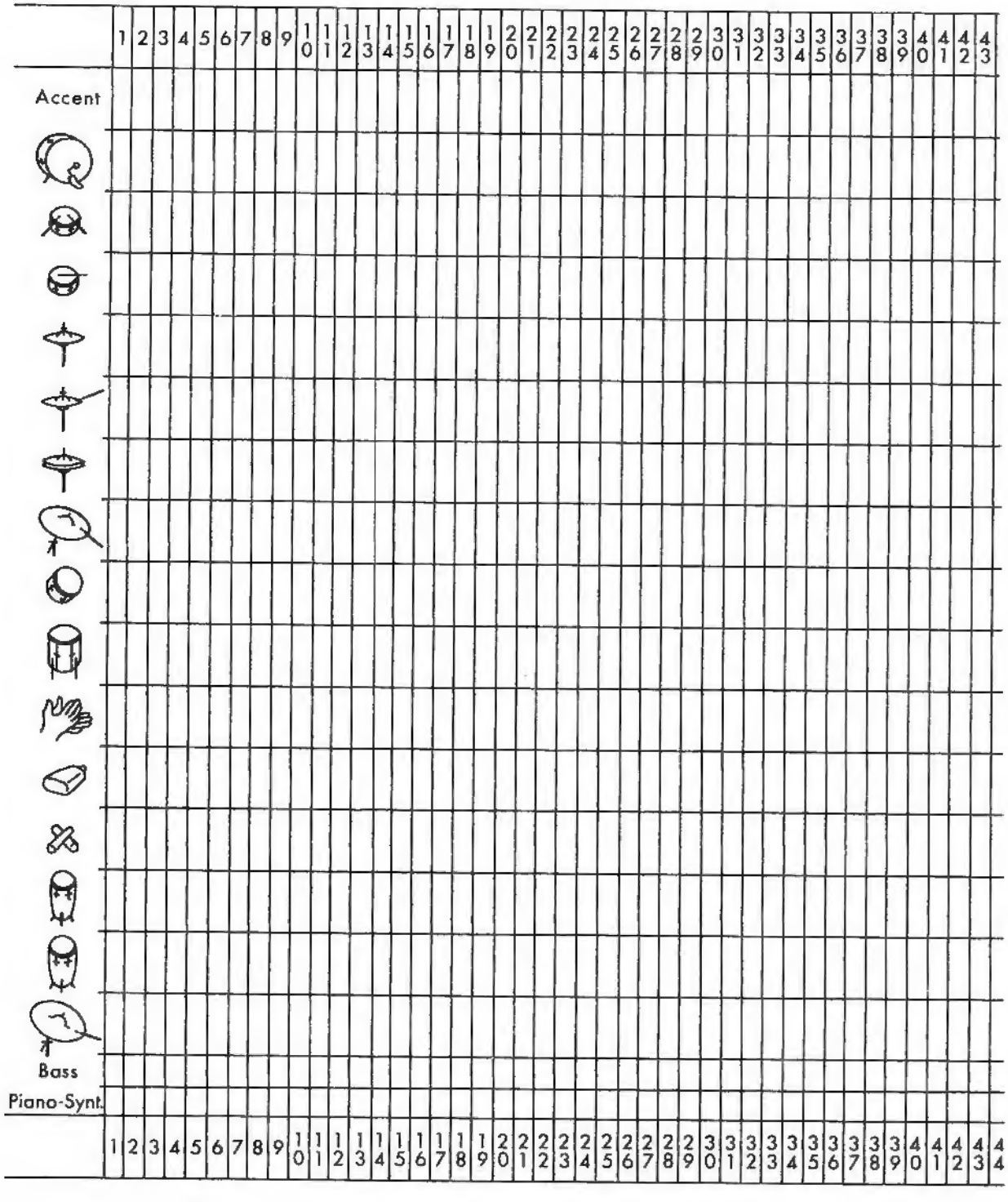
On the rear of the sheet the structure of a standard Pattern with the highest Error Correct value available, i.e. E96, is indicated.
These tables may be of great usefulness in the case of Step by Step programming of Rhythm, Bass and Piano (or Synt).
The notes of the Bass and Piano can be indicated with their own symbols (C, D, E, F, G, A, B), whereas the octave to which the note belong may be represented by a number (f.e. : C1 = 1° C of the keyboard, C2 = 2° C of the keyboard etc.).
The musical inflectings may be indicated by ♭ or ♯.
These indications will permit you to define with utmost precision the notes of the Pattern Sequences to be programmed on each one of the steps available.
(See Step by Step Programming of the Rhythm - Pag. n. 7, and Step by Step Programming of Bass and Piano - Pag. n. 8).

② PATTERN CHART

DIAGRAM OF THE STANDARD PATTERN AT MAXIMUM ERROR CORRECT VALUE (TI

PATTERN NUMBER : TIME : ERROR C

BEATS 1 2

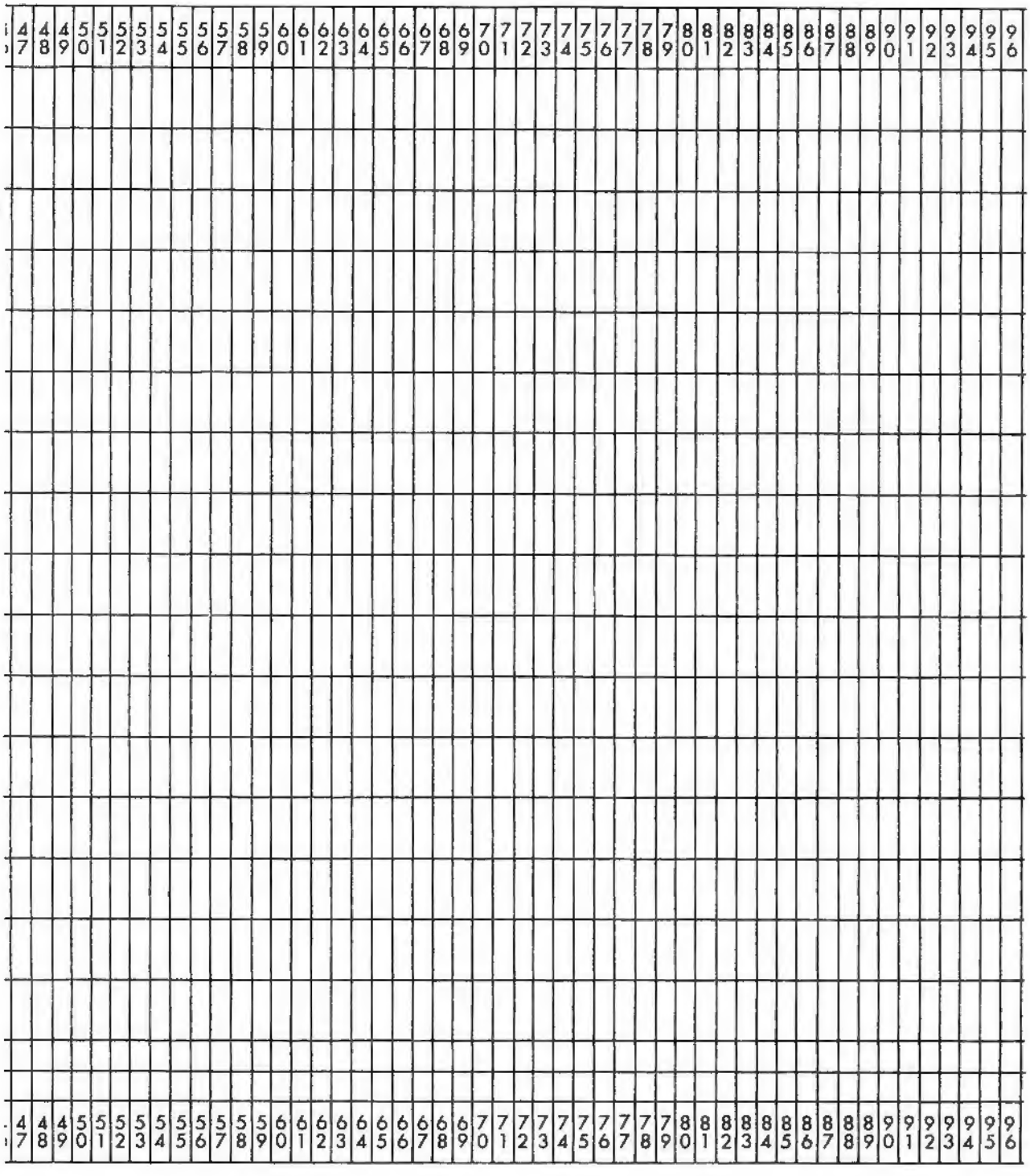


PLEASE COPY AND USE. THIS DIAGRAM IS USEFUL TO PROGRAM PATTERNS WITH ALL ERRO

4.4 ; E 96)

ECT :

3 4



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