Manufacturers of Quality Components



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Blowers Combination Systems Drawstop & Slider Action Electrical Products Note Switching Systems Power Supplies Swell Action

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We are pleased to see organ builders who wish to visit our works. Ramsbottom is very conveniently located with easy access to the national motorway network. It is also within easy reach of the railway network and Manchester International Airport.

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Blowers



High Speed 3 to 22 Cm 105 to 780 cfm Low Speed 28 to 43 Cm 1000 to 1525 cfm

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Horizontal Blower

3CM 105cfm

4203 3 cubic metres (105 CFM) *Single phase* .18 Hp (.13 kW) 2800 rpm 50 Hz Static wind pressure 100 - 80 mm 240 mm high ; 320 mm wide ; 310 mm deep ; 9.3 Kg Wind exit 78 mm wide ; 70 mm high.





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High Speed Blowers

5 to 22 CM 175 to 780 cfm

- 4205 5 cubic metres (175 CFM) Single phase .25 hp
- **4209** 9 cubic metres (320 CFM) *Single phase .45 hp*
- **4214-1** 14 cubic metres (500 CFM) *Single phase .75 hp*
- **4214-3** 14 cubic metres (500 CFM) *Three phase* .75 *hp*
- **4222-1** 22 cubic metres (780 CFM) *Single phase* 1 hp
- **4222-3** 22 cubic metres (780 CFM) *Three phase* 1 hp





| | 4205 | 4209 | 4214 | 4222 |
|---|------|------|------|------|
| Α | 315 | 400 | 450 | 500 |
| в | 355 | 450 | 510 | 555 |
| С | 205 | 260 | 292 | 325 |
| D | 125 | 125 | 125 | 130 |
| Е | 90 | 125 | 153 | 190 |
| F | 180 | 205 | 205 | 240 |
| G | 85 | 125 | 160 | 160 |
| н | 150 | 200 | 205 | 205 |
| I | 155 | 225 | 225 | 225 |
| J | 170 | 225 | 243 | 243 |
| к | 70 | 108 | 140 | 140 |
| L | 78 | 105 | 130 | 130 |
| м | 87.5 | 115 | 125 | 125 |
| | | | | |
| | | | | |

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Low Speed Blowers

28 to 43 CM 1000 to 1525 cfm

4228-3-120 28 cubic metres (1000 CFM) *Three phase 120 mm 1.5 hp* **4228-3-140** 28 cubic metres (1000 CFM) *Three phase 140 mm 1.6 hp* **4236-3-120** 36 cubic metres (1280 CFM) *Three phase 120 mm 2.0 hp* **4236-3-140** 36 cubic metres (1280 CFM) *Three phase 140 mm 2.1 hp* **4243-3-120** 43 cubic metres (1525 CFM) *Three phase 120 mm 2.5 hp* **4243-3-140** 43 cubic metres (1525 CFM) *Three phase 140 mm 2.6 hp* **4243-3-160** 43 cubic metres (1525 CFM) *Three phase 140 mm 2.6 hp* **4243-3-160** 43 cubic metres (1525 CFM) *Three phase 160 mm 2.8 hp* **4243-3-180** 43 cubic metres (1525 CFM) *Three phase 160 mm 2.8 hp*



| | 4228 | 4236 | 4243 | |
|---|------|------|------|--|
| А | 800 | 800 | | |
| В | 873 | 873 | | |
| С | 902 | 902 | | |
| D | 750 | 750 | | |
| н | 685 | 685 | | |
| I | 80 | 80 | | |
| К | 185 | 185 | | |
| L | 255 | 255 | | |



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TMS 9000 Combination Systems



General Crescendo & Tutti Stepper Sequencer ID Card TMS 32 & 64

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TMS 9000 Combination Systems

The TMS 9000 Piston Combination System provides all the necessary playing aids and is designed for use with Drawstop, Stop Key or Illuminated switch consoles.

Features:

- Simple and fast installation
- Simple Test Board set out
- Modular Design to cater for future additions
- Green recyclable system
- Normal operating voltage 12 to 24 volts DC
- 1 amp output drive capacity
- Spark suppression diodes fitted as standard
- Standard metal enclosure finished in matt black size W:500, H:255, D:235
 Standard size switch panels 90 x 50mm or 50 x 50mm
- 16 or more stops per. division
- 8 or more Divisional pistons
- Divisional Cancels
- Optional Illuminated pistons
- 16 or more reversible pistons
- 8 or more General pistons
- General Cancel
- Setter
- 8 or more Divisional levels (channels)
- 8 or more General levels (channels)
- Piston Couplers
- Optional Crescendo Pedal
- Optional Tutti Piston
- Optional Stepper
- Optional Sequencer
- Optional Memory Card Interface



Pinboard Layout

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Switch and Digital Display Panel Options ILLUSTRATIONS NOT ACTUAL SIZE



Rotary Switch Panel - Engraving Options availabe (50mm x 50mm)



Optional Key Switch (50mm x 50mm)



Level Switch Panel (90mm x 50mm)



Itron Level Display - Options available



(Visible Display area from front 57mm x 29mm)
(Display dimensions at rear 98mm x 46mm)



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Crescendo & Tutti

The Crescendo pedal and Tutti piston are designed to operate the organ stop action without operating the drawstop action; that is, they operate blind.

CRESCENDO PEDAL

The crescendo pedal has 32 stages. In addition to a standard setting, three other settings A, B, & C can be selected.

On

Normally, the display will follow the pedal movement.

However, only when the crescendo pedal is switched on will the outputs be active. **Crescendo Program**

This switch is used when programming the crescendo pedal and is provided with a small LED to confirm the program mode.

When in this mode the crescendo pedal is disabled.

Next

This switch is used when programming the crescendo pedal to select each stage which is to be programmed. Alternatively, the crescendo pedal may be used to select each programmed stage.

Blind Check

This switch is used to confirm the settings programmed on the crescendo pedal or tutti piston by operating the drawstop action. The blind check will only operate when in the crescendo program mode.



Crescendo Switch panel (90mm x 50mm)



Crescendo Itron Display Panel (In this illustration, the Crescendo is shown with the Standard Levels (Visible Display area from front 57mm x 29mm) (Display dimensions at rear 98mm x 46mm)

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Tutti Piston (Supplied by organ builder)

TUTTI PISTON

The Tutti or Full Organ piston operates in a similar way to a crescendo pedal. The tutti piston is programmed using the setter piston. The selected registration can be checked using the blind check switch.

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Stepper

Playing aids have always reflected the music of the period. Many organs have no playing aids, some are fitted with primative fix combination pedals, and others have a modern instantly changeable combination system.

The use of playing aids can add another dimension to the music, providing the organist with a palette loaded with musical colours and textures.

The commercial demands made on Concert Hall Managers to achieve as much usage as possible has severely reduced and restricted time available for practice. Add to this the possibility of an unfamiliar organ console and, in this situation many recitalists gladly accept any aids that will allow more efficient use of practice time.

Today, modern technology makes almost anything possible. So was born the piston Stepper and Sequencer.

The piston Stepper is a simple aid that allows advancement through the general pistons using NEXT and PREVIOUS pistons. The NEXT piston automatically advances the registration to the next general piston setting. The PREVIOUS piston allows movement backwards through the general pistons. The stepper display provides a visual indication of the exact position and displays the level and general piston number. Alternatively, the level display can be augmented by illuminated thumb and toe piston which indicate the last general piston used.



Stepper Display (Visible Display area from front 57mm x 29mm) (Display dimensions at rear 98mm x 46mm)

Display showing general level and last general piston pressed



Next & Previous Pistons (supplied by organ builder)

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Sequencer

The Sequencer allows the storage of a completely independent set of general registration settings which are instantly recalled using a NEXT and PREVIOUS piston, The size of the organ will dictate the number of sequencer settings that are available. Normally in excess of 1000 sequencer settings can be stored, equivalent to an additional ten general pistons on one hundred levels.

The sequence number, therefore, represents the registration steps through a piece of music. In many cases reflection will dictate that changes are necessary and may involve the addition or removal of sequences. The INSERT and DELETE switches have been provided for such occasions. The INSERT function allows one insert to be made between two sequences and is indicated by a suffix to the display. The DELETE function allows a sequence or a set of sequences to be deleted.

In addition to the next and previous pistons a RESTORE button is provided. It must be remembered that the sequencer works alongside and in addition to the normal piston system. A visual LED is provided to indicate when the sequencer display has been over-ridden and is no longer valid. This could occur when the registration has been changed by hand or by use of pistons. The RESTORE piston is used in this situation to restore the registration to that indicated on the sequencer display but will not advance to the next sequence.



Pistons supplied by organ builder

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ID User Card



The TMS 9000 ID Card Reader offers a simple secure way of allowing several organists use of a Piston Combination System. The card, which is similar in size to a normal credit card, contains only an identity number to identify each user (organist). No information regarding the piston combination settings is stored on the card. This is only stored in the piston combination system memory . Normally, seven cards with identities from 2 to 8 are provided. ID 1 is used as the default ID and may be used by any organist without a card. Validation of the card identity is indicated by the ITRON display.



This illustration shows the I.D. "USER" situated above the standard Levels Displays. **Display Options available** (Visible Display area from front 57mm x 29mm) (Display dimensions at rear 98mm x 46mm)

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TMS 32 & 64 Piston Combination Sytems

The TMS 32 is an economical Rotary Switch selected bi-level Piston Combination System for organs with up to 32 stops.

The TMS 64 is an economical 8 level Rotary Switch Piston Combination System for organs with up to 64 stops.

Features:

- Simple and fast installation
- Simple Test Board set out
- Green recyclable system
- Normal operating voltage 12 to 24 volts DC
- 1 amp output drive capacity
- Spark suppression diodes fitted as standard
- Standard metal enclosure finished in matt black
- Enclosure size 265 wide, 235deep, 265 high
- Standard size rotary switch panel 50mm x 50mm





TMS 64 Rotary Switch Panel 50mm x 50mm**TMS 32 Rotary Switch Panel** 50mm x 50mm(Engraving options available)

| | | Ô | |
|------------|-----------|-----|--------------|
| 00 | | | |
| | | | |
| 0-0 | | ھە | ON |
| 00 | | 00 | OFF |
| 00 | | 00 | SWITCH |
| ۵۰ | | | |
| 00 | 1 GREAT | œ | |
| | | 0-0 | |
| 0-0 | | 00 | |
| 0-0 | | | |
| 0-0 | | 0-0 | |
| œ | | 00 | Swell Stop 4 |
| 0-0 | | 00 | |
| 0-0 | | | |
| 0-0 | | 0-0 | |
| 0-0 | 1 PEDAL | 00 | Swell Stop 3 |
| | | 00 | |
| O O | 8 | | |
| 0-0 | | 00 | |
| 0-0 | | 0-0 | Swell Stop 2 |
| 0-0 | | ••• | |
| 0-0 | | | |
| 0-0 | | 00 | |
| •• | | ••• | Swell Stop 1 |
| 0-0 | 1 GENERAL | | |

Pinboard Layout

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Drawstop Action



Drawstop Solenoids Slider Solenoids Slider Controllers Angled Toe Piston

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Long & Short Draw Bushed Drawstop Solenoids



| 1946 - 15 | Short Draw Bushed Nose Mounting Single Reed Switch 15 volt coils DC |
|-------------|--|
| 1946 - 24 | Short Draw Bushed Nose Mounting Single Reed Switch 24 volt coils DC |
| | |
| 1947 - N15B | Long Draw Bushed Nose Mounting Single Reed Switch 15 volt coils DC |
| 1947 - N24B | Long Draw Bushed Nose Mounting Single Reed Switch 24 volt coils DC |
| | |
| 1947 - M15B | Long Draw Bushed Mid flange Mounting Single Reed Switch 15 volt coils DC |
| 1947 - M24B | Long Draw Bushed Mid-flange Mounting Single Reed Switch 24 volt coils DC |
| | |
| | |

1947A Additional reed switch including socket and crimp terminals

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Long & Short Draw Bushed Drawstop Solenoids

Our Drawstop Solenoids can be found in many prestigious instruments around the world.

The listed price of each unit includes either felts or grommets for quiet armature mounting,

Black Shanks, Reed Switch and rear plug in connector.

Twin Reeds and connectors also available.

The mid flange units are supplied with a soldered flange which can be fitted to the customers specification.



Grommets fitted

- **1946 15** Short Draw Bushed Nose Mounting Single Reed Switch 15 volt coils DC
- **1946 24** Short Draw Bushed Nose Mounting Single Reed Switch 24 volt coils DC



Felted

1947 - N15B Long Draw Bushed Nose Mounting Single Reed Switch 15 volt coils DC1947 - N24B Long Draw Bushed Nose Mounting Single Reed Switch 24 volt coils DC

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Felted

- **1947 N15** Long DrawNose Mounted Single Reed Switch 15 volt coils DC
- **1947 N24** Long DrawNose Mounted Single Reed Switch 24 volt coils DC



1947 - M15B Long Draw Bushed Mid flange Mounting Single Reed Switch 15 volt coils DC

A. J. & L. Taylor Ltd

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Slider Solenoids



Suitable for use with most types of Slider Solenoid Controllers. Manufactured using numerically controlled machines to the very highest engineering tolerances.

- Finished for long lasting protection against corrosion
- 20-28mm armature travel. Threaded M8
- Resilient mountings for M6 set screws, with thick felt stops for quiet operation
- 4.2 ohm intermittently rated coils
- Strong pull 50N at 12 volts DC
- Simple three pin terminal block connection

| 1948 - 15 | Slider Solenoid 15 volt coils DC |
|-----------|--|
| 1948 - 24 | Slider Solenoid 24 volt coils DC |
| 1948A | Optional Switch for Dual registration system |

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Slider Solenoid Controllers



Normal Action Slider Controllers with integral power supply



Normal Action Slider Controller



For many years Organ Builders have endeavoured to build organs with silent drawstop actions.

The slider solenoid controller allows fine adjustment of the slider or coupler chassis solenoids.

- Maximum solenoid current 3.5 amps
- Independent adjustment of ON and OFF stroke
- Holding Circuit
- Plug in printed circuit boards with one controller per. board
- Simple screw terminals for all connections on motherboards
- Metal enclosure finished in matt black housing up to 16 controllers Size 265 wide, 235deep, 265 high
- Optional mounting of 1937 power supplies on sides of card frame

| 1903 - C | Normal Action Slider Controller 12 - 24 volts DC |
|----------|--|
| 1945 - C | Parallel Action Slider Controller 12 - 24 volts DC |

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Angled Toe Piston

31.00

55.00



A toe piston designed for surface mounting made from solid brass.

1991 - A Angled Toe Piston

- Firm positive action
- Thick felt stop for quiet operation
- Simple adjustment of switch position
- Switch contacts rated at 0.5 amps

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Electrical Products



Link Combination Soundboard Drivers Soundboard Cutout Off Notes Pedal Derivation Board Key Buffers Tremulant Pulsator

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Link Combination Systems





A simple and cost effective solid state piston combination system using shorting links for stop selection.

Specifically designed for small organs that do not merit a more comprehensive combination system.

- Up to ten departmental or general pistons
- Each stop is set using a small shorting plug to select ON, OFF, or NEUTRAL
- Reversible pistons
- Normal 12 to 24 volts DC operation
- 1 amp Output drive capacity
- Spark suppression fitted as standard
- Mounted on a polished wood frame
- Height 325mm, length to suit the number of stops

| 1907 - 4 | Link Settable Combination System 1 - 4 pistons per stop |
|-----------|--|
| 1907 - 6 | Link Settable Combination System 5 - 6 pistons per stop |
| 1907 - 8 | Link Settable Combination System 7 - 8 pistons per stop |
| 1907 - 10 | Link Settable Combination System 9 - 10 pistons per stop |
| | |



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5 x 61 Soundboard Driver





To overcome the problems that can occur with traditional slider barsoundboards subjected to the extremes in temperature and humidity, many organ builders resorted to the use of some type of sliderless bar type soundboard. Whilst these sliderless soundboards have proved more resilient, nothing lasts forever and many organ builders are responsible for repairing such failing actions.

A convenient solution is to replace the pneumatic valve under each pipe with a direct electric pallet.

The 5 x 61 Note Diode Electric Soundboard Driver is designed to control 5 ranks of 61 note pallet magnets including 5 solid state stop cutouts.

For soundboards with more than five straight ranks, more than one board can be connected together.

- Designed for 12 to 24 volts DC operation
- Spark suppression diodes fitted as standard
- Maximum load per note 1.0 amp
- Size: 600 x 600mm
- •

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Off Notes



A compact and cost effective method of providing for the unexpected group of pipes not planted on the main soundboards. Designed to be fed from the output stage of a switching system so that all couplers are effective.

- Six notes per board fitted with suppression diodes
- Each board of six notes has its own switch allowing all magnets to have a common feed
- Inputs can be connected together for common bottom or top notes
- Normal operating voltage 12 to 24 volts DC
- Maximum current per output 1 amp
- Normally +Ve IN and + Ve OUT
- Standard metal enclosure, finished in matt black, housing up to 32 boards.
- W:500, H:255, D:235mm

1910 Offnote board (6 notes)

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Pedal Derivation Boards



Many small country churches have limited financial resources to spend on fanciful rebuilding schemes.

Many may have reliable manual key actions with failing pedal pneumatic action. In many cases the most cost effective solution is to electrify the pedal action. The pedal derivation boards provide a simple solid state switching system which allows up to three derivations from each pedal unit. eg. 16,8,4 or 8,4,2

- Normal operating voltage 12 to 24 volts DC operation
- Maximum load per magnet 1 amp
- Spark suppression diodes fitted as standard
- Size: 520 x 230

- **1919 2** Pedal Derivation board, 2 derivations
- **1919 3** Pedal Derivation board, 3 derivations

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Key Buffers



A range of simple transistor buffers designed to reduce key contact currents.

- Each board is fitted with suppression diodes
- Normal operating voltage 12 to 24 volts DC
- Maximum current per. output 1 amp
- Normally +ve IN and +ve OUT, but other combinations are possible
- size 485 x 120

| 1917 - 32 | 32 Note Key Buffer | NN, NP, PN, PP |
|-----------|--------------------|----------------|
| 1917 - 61 | 61 Note Key Buffer | NN, NP, PN, PP |

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Tremulant Controller





- Normal operating voltage 12 to 24 volts DC
- Maximum current per. output 1 amp
- +ve IN and +ve OUT
- Adjustable depth and speed controls
- Size: 90 x 50

1918 Solid State Tremulant Pulsator

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TMS 9000 Note Switching Systems



General TMS 9000 Small Cable Link Midi



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General

Computers, today, are widely used throughout the business and commercial world. Small microprocessor based computers are also used extensively in hospitals and many people are alive today as a result of such technology and its reliability.

Many Organ Builders use computers to assist with everyday design, production and office management. Such is the change in attitudes experienced over the last couple of decades.

In the 1970's when we developed the TMS 9000 microprocessor based microprocessor systems, Organ builders could not comprehend how a small piece of black plastic could become the brain of an organ's note switching and combination system.

The TMS 9000 owes its success to its modular design and flexibility. The use of standard plug in circuit cards using readily available components has stood the test of time and should allay fears of that dreaded word "obsolescence". Not many electronic designs can claim such a long product life and yet still be a market leader.

At the heart of each system is a microprocessor printed circuit card which contains the relevant software. Keyboards, pedalboards, stops, pistons, swell pedal contacts, or any other form of contacts, are connected to INPUT printed circuit boards. These convert contact movements into signals which the microprocessor board can understand. Once the software has inspected all the inputs, the necessary actions are fed to the OUTPUT printed circuit cards which transfer the necessary information to operate soundboard and unit action magnets, drawstop solenoids, swell pedal movements, LED displays and illuminated thumb pistons, etc.

There are three types of printed circuit cards in each system: always one microprocessor card, and varying numbers of input and output cards. Each input or output card can interface directly to 64 inputs or outputs. The organ is, therefore, partitioned in sections of 64, a number which conveniently fits the 61 note keyboard and 32 note pedal board compass.

For note switching systems using 56,58 or 61 note keyboards, one input card and one output card is needed for each manual department. 30 or 32 note pedalboards use half a card, which leaves half a card, or 32 inputs and outputs, for couplers and unit stops, etc. Should half a card not be sufficient, the number of stops or couplers can be increased by including further cards, adding 64 or 128 inputs, etc. as required.

Piston combination systems use a similar concept of sub division of 64, into 32, 16 or 8. Departments are generally 8,16,24,32,40,48,56 or 64, etc.., and pistons are normally 8,16 etc.. per department. Special piston action functions are also available.

The printed circuit cards are housed in a metal enclosure and connect to each other at the rear by a 16 slot Mother Board. For reliability of connections, two-part DIN 41612 connectors are used and important connections along the Mother Board use two pins of each connector, providing enhanced reliability.

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General (cont.)

A 64 way connector is mounted on the front edge of most printed circuit cards. The connector is factory wired to a test board set out in organ building terms and provides the most convenient form of connection. The provision of a single high quality removable two part DIN 41612 connector on the front of each printed circuit board also provides a simple yet reliable way of allowing the temporary removal of wiring looms for site installation.

Simple testing and checking procedures are possible by unplugging the cable connectors connected to the imput and output boards and substituting switch and LED test cards. The switch test card is used to replace key contacts or any other form of contact and can be used to confirm a fault within the input wiring. Similarly the LED test card can be used as a substitute for action magnets or any other output and can confirm a fault within the output wiring.

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TMS 9000 Note Switching Systems

The TMS 9000 Note Switching System uses the same standard printed circuit boards as the Piston Combination System to interface to Keys, Stops and action magnets.

Features:

- Simple and fast installation
- Single contact for each key and stop
- Modular design to cater for further additions
- Green recyclable system
- Normal operation voltage 12 to 24 volts DC
- 1 amp drive capacity
- Spark suppression diodes fitted as standard
- Standard metal enclosure finished in matt black size: W:500, H:255, D:235

| | | •• | | •• | 24 |
|---|------------------------|-------------|----------------------|-----|----------------------|
| | | ••• | | 0-0 | 23 |
| • | Octave Couplers | 0-0 | | 00 | 22 |
| _ | Sub Ostava Couplara | | | | 21 |
| • | Sub. Octave Couplers | | | 6-6 | 20 |
| • | Unison Offs | õõ | | õõ | 18 |
| • | Intermanual Couplers | 0 -9 | | 0-0 | 17 |
| • | International Couplets | ••• | | 0-0 | 16 |
| • | Unit Derivation | ••• | | •• | 15 |
| • | Transfers | | | | 14 |
| | | | | ~ | 15 |
| • | Pedal Sostenuto | • | 12 | • | 12 |
| • | Pedal Divide | ••• | 11 | 0-0 | 11 |
| | Maladia Daga | ٩ | 10 | 0-0 | 10 |
| • | Melodic Bass | ••• | 9 | | 9 |
| • | Transposer | | 8 | | 8 |
| | Small Cable Link | | 6 | õ | 6 |
| • | Siliali Cable Lilik | õõ | 5 | õõ | 5 |
| • | Replay | ••• | 4 | 0-0 | 4 |
| | Midi | ••• | 3 | 0-0 | 3 |
| • | Ivitui | 0-0 | 2 Swell Keys 1-61 | 00 | 2 Great Keys 1-61 |
| | | | 1 5/101 | •• | |
| | | | | | |
| | | | | | |

Pinboard Layout in Octaves

• Standard size wood test boards set out in octaves for ease of connection to keyboards and action magnets, attached to 2 metre long looms, 610 x 230mm, 710 x 343mm

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Small Cable Link

The TMS 9000 Small Cable Link is an extension of the TMS 9000 Note Switching System. Normally the input and output boards are housed in a single card frame. However, in certain circumstances, the console may be detached from the pipework and, in this situation, it is more convenient to separate the input and output boards. This is achieved using a small diameter cable to carry data and synchronising signal together with a safety power down signal. In view of the high scanning speed, typically 200 times per second; and the need to have a high immunity to outside interference, a balanced differential line driver is used.

Under normal circumstances, one pair of wires is used for each signal. An additional pair of low voltage wires is available in the cable to control the organ blower and transformer rectifier units.

The cable is terminated in a 25 way plug and socket or 8 way plug and socket. Cable diameter 6mm.

Alternatively, certain circumstances may dictate that the system card frames are connected using a network link.



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MIDI

Musical Instrument Digital Interface.

MIDI was designed to allow a convenient method of interconnecting several electronic synthesisers.

MIDI is, therefore, a protocol for transferring information from one electronic instrument to another electronic instrument or instruments.

The TMS 9000 MIDI interface allows MIDI IN, MIDI THRU & MIDI OUT.



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Power Supplies

Useful information

Current = Voltage / Resistance

Example: 100 ohm coil at 15 volts DC

Current = 15 / 100

= 0.15 amps

Cable Losses

Voltage drop per. cable = Current in amps x cable factor x length in metres

| Area mm ² | 0.078 | 0.196 | 0.22 | 0.5 | 0.75 | 1 | 1.5 | 2.5 | 4 | 6 | 10 | 16 | 25 |
|----------------------|-------|-------|------|-------|-------|-------|--------|--------|--------|-------|-------|--------|--------|
| Cable Size | 10/.1 | 1/.5 | 7/.2 | 16/.2 | 24/.2 | 32/.2 | 30/.25 | 50/.25 | 56/.36 | 84/.3 | 80/.4 | 126/.4 | 196/.4 |
| Cable Factor | .242 | 0.1 | 0.09 | 0.04 | 0.02 | 0.02 | 0.01 | 0.01 | 0 | 0 | 0 | 0 | 0 |

Example: 30 amps transformer, 16mm2 cable, 20 metres long

Voltage drop in each cable = $30 \times 0.00118 \times 20$

= 0.708 volts



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1939SM 500 watt 32 Amp Power Supply





Features :

Adjustable Output from 14 to 18 volts DC. World-wide operation from 90 ~ 260 volts AC 47 ~ 63 HZ. Short Circuit, over load, over voltage & over temp protection. Current limit set at 33 amps. High efficiency and reliability. 100 % full load burn-in-test. Power factor correction .99 AC current consumption 5 amps ~ 115V 2.40 amps ~ 240V Safety standards UL 60950, CSA C22.2 No 60950, EN60950 EMC standards EN61000-3-2,-3, FCC Pt 15 & CISPR 22 Class B conducted

Size 140 mm wide x 260 mm deep x 80 mm high Weight 2 Kg

The power supplies must be positioned in a well ventilated area and the fan MUST NOT BE OBSTRUCTED.

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Swell Machine





1987V2 Swell Machine



A small compact Expression Pedal machine with infinite movement.

- Maximum force 100N
- Adjustable travel 90mm maximum
- Adjustment of end position
- Integral controller and power supply with overload protection
- Optional Expression pedal potentiometer assembly

| 1981 | Pedal Pot Assembly |
|--------|--|
| 1987 | Swell Machine |
| 1988 | Swell Machine Controller |
| 1988PC | 16 stage Swell Pedal to Swell Machine Controller Board |

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Swell Machine Automatic Parking Controller





Normal System



A small self contained unit to automatically open the swell shutters when the organ is switched OFF. **Features :**

Self contained unit Adjustable open position Adjustable switch OFF delay time Size 125 mm wide, 225 mm deep, 120 mm high, weight 1 Kg

1988B-115 Automatic Parking Controller 115 volts ac