Strata VI®

GENERAL DESCRIPTION

Strata VI

GENERAL DESCRIPTION

TABLE OF CONTENTS

ILLUSTRATION LIST

01 GENERAL

01.01 Summary Description

01.02   The STRATA VI is an elec-
tronic key telephone system with many
standard features; utilizing stored pro-
gram control, custom L.S.I. circuitry,
solid-state space division switching and
reduced station cabling.   Served by a
key service unit (MKSU) housed in a
single cabinet, the system has a cap-
acity of six central office/PBX lines,
two intercom lines and 16 station lines.

01.03   STRATA VI includes a spe-
cially designed electronic key tele-
phone (EKT) which incorporates hands-
free answering and full speakerphone
capabilities as standard features.   Each
EKT is connected to the system via
industry-standard 2-pair cabling, and is
equipped with a push-button dial pad.
Solid state electronics within the MKSU
translates signals from the station dial
pad into either DTMF or rotary dial
signals, as required by the central
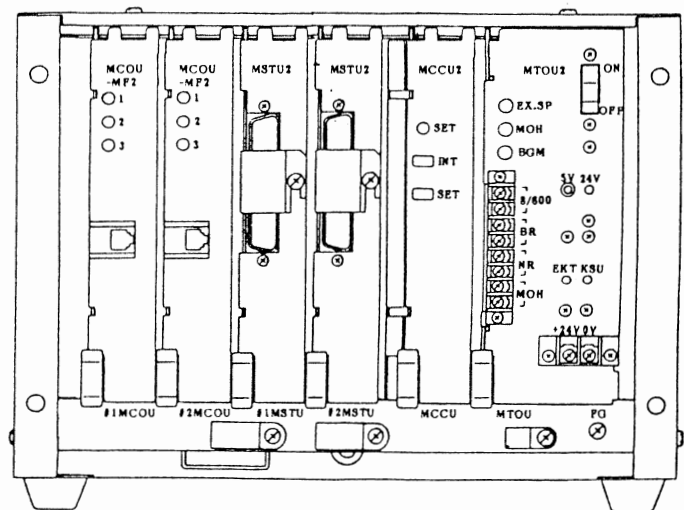office (CO).

01.04   STRATA VI is electrically
compatible with the public telephone
network and is also designed to
function in a "behind PBX" environment.

01.05   Maintenance procedures are
based on quickly locating and replacing
defective plug-in units, keeping service
disruption to a minimum.

01.10 Physical Descriptions

01.11   Designed for table-top or wall
mounting, the STRATA VI MKSU is
housed in a single metal cabinet (Figure
1) with the following dimensions:

        Height   9.4 inches (239 mm)
        Width   12.3 inches (313 mm)
        Depth   11.8 inches (300 mm)
        Weight 19.8 lbs.   (9 kg)

FIGURE 1

It contains a single shelf arranged to
accommodate up to six printed circuit
boards (Figure 2).   The printed circuit
boards (PCBs) plug into connectors
mounted on the back plane of the
equipment shelf.

FIGURE 2

01.12   Each PCB measures 8.7 x 7.1
inches (220 x 180 mm) and is equipped
with either an 80- or a 100-pin edge
connector.   All external MKSU connec-
tions are made on the front panels of
the various PCBs using cables with in-
dustry standard couplers.
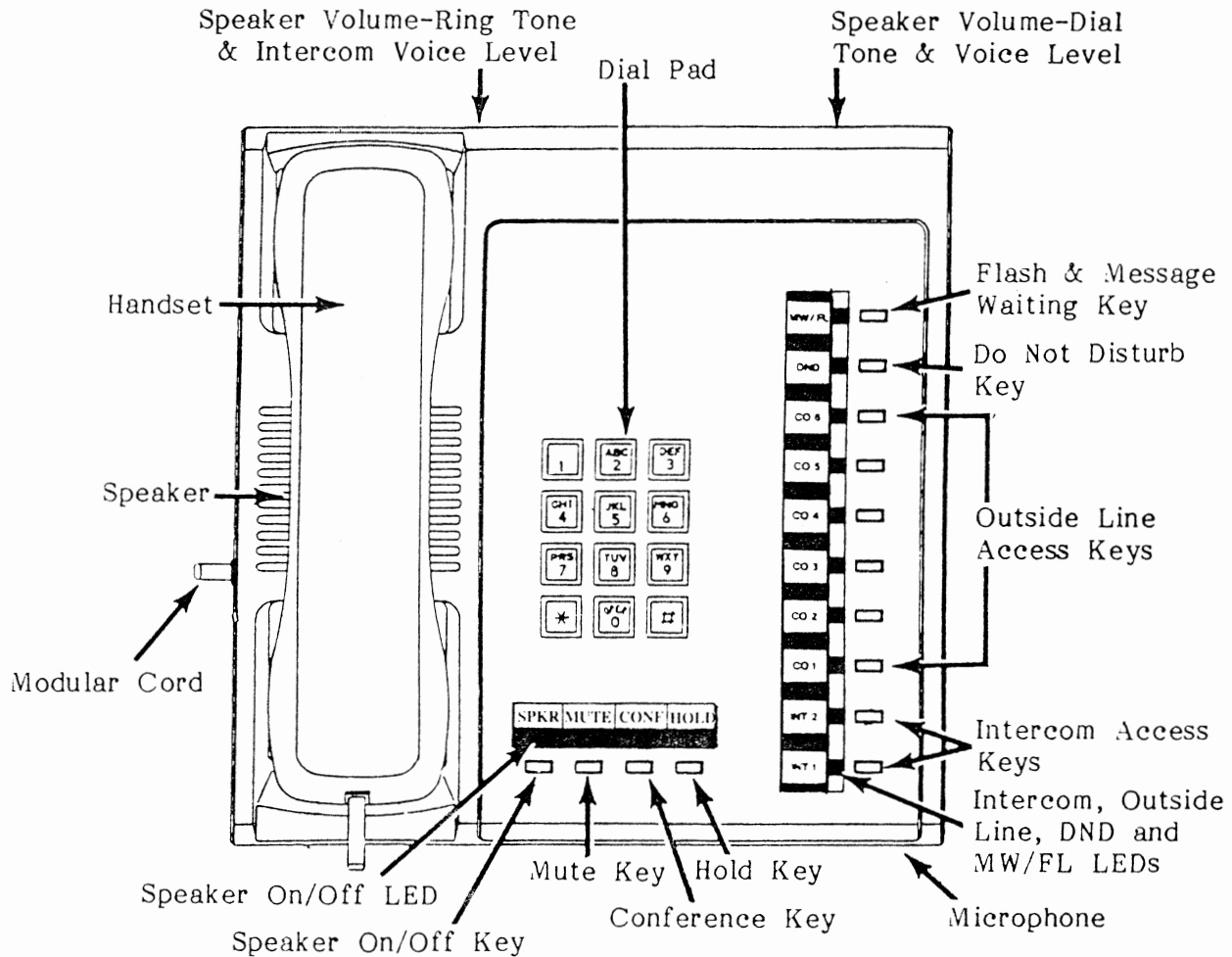
FIGURE 3

01.13 The STRATA VI electronic key telephone (EKT) (Figure 3) measures:

Width	8.8 inches (224 mm)
Depth	9.1 inches (230 mm)
Height	4.0 inches (102 mm)

and is equipped with 14 line and feature keys in addition to its push-button dial pad. Six of the keys are utilized for central office/PBX lines, two for intercom lines and the remaining six keys are used for feature operation. Each EKT features a modular handset cord and is connected to the system via a 2-pair modular line cord.

01.14 An optional Busy Lamp Field (BLF) EKT (Figure 4) provides LED indication on which stations are in use.

01.15 An optional executive 20-key telephone (Figure 5) provides, via 10 additional feature keys; seven one-key automatic-dialing (AD 1 ~ 7) telephone numbers, repeat last number dialed, pause and automatic-dialing access.

NOTE:
The automatic dialing-station option (CRDU PCB) is required for the executive telephone.

FIGURE 4

FIGURE 5

01.20 Electrical Characteristics

01.21   The electrical characteristics of the system are detailed in Table A.

01.22   The MKSU operates from an external 24VDC power supply.

01.23   Loss of AC power will cause operational failure of the system. System memory, however, is protected from loss due to power failure with internal battery power. Full system reserve power is available as an option.

01.30 Features and Services

01.31   The features and services of the STRATA VI electronic key telephone system are summarized in Tables B and C, which list the standard and optional features respectively.

TABLE A

SUMMARY OF ELECTRICAL CHARACTERISTICS

Station Loop Limits	1000 ft. (305 M), 24 AWG
Ringing Tone	
CO Line (idle)	600/800 Hz, modulated by 16 Hz, 1 sec on—3 sec off
(busy)	2400 Hz, modulated by 10 Hz, 1 sec on—3 sec off
Intercom Line	600 Hz, 1 sec on—3 sec off
Busy Override Tone	2400 Hz, 1 sec on—3 sec off
Dial Tone (Intercom)	600 Hz, continuous
Ring-back Tone	600 Hz, 1 sec on—3 sec off
Busy Tone	600 Hz, 0.25 sec on—0.25 sec off
Do Not Disturb Tone	600 Hz, 0.12 sec on—0.12 sec off
Voice Page Warning Tone	600 Hz, 1 sec on only (via EKT spkr)
Executive Override Warning Tone	600 Hz, 0.5 sec on only (via handset)
Dialing	Push-button; system generated DTMF or dial pulse
Primary Power	90 ~ 130VAC, 60 Hz, 96 VA
Hold Recall Tone	2400 Hz, modulated by 10 Hz, 1 sec on—1 sec off
Environmental Specifications	
Operating Temperature	0 ~ 50°C
Operating Humidity	20 ~ 80% relative humidity (without condensation)

TABLE B

STANDARD FEATURES

SYSTEM

- All call voice page
- Alternate point answer
- Automatic dialing—system
- Automatic hold recall
- Automatic privacy with release
- Automatic release from hold
- Background music with station control
- Busy override
- Conference—multi-station
- Conference—multi-trunk
- Distinctive ringing
- DTMF and dial pulse compatible
- External page interface
- Flash key—PBX line transfer or CO dial tone recall

- Flexible line ringing assignment
- Live system programming
- Message waiting
- Multiple simultaneous handsfree intercom paths
- Music-on-hold interface
- Night ringing over external speaker
- Night transfer of ringing
- Non-blocking dialing
- Outgoing call restriction
- PBX compatible
- Private CO lines
- Repeat last number dialed
- Toll restriction
- Voice or tone signalling
- Wall mountable MKSU

STATION

- Do not disturb
- Do not disturb override
- Executive override of privacy
- Handsfree talk-back
- I-called illumination
- I-hold illumination
- I-use illumination

- Modular handset and line cord
- Mute key
- On-hook dialing
- Push-button dialing
- Ringing line preference
- Speakerphone

TABLE C

OPTIONAL FEATURES

- Automatic dialing—station
- Busy Lamp Field (BLF) EKT
- Relay service
  External page
  Night transfer

- System battery back-up
- 20-key executive EKT
- Wall mounting kit for EKT

02 SYSTEM OPERATION

02.01 The system (Figure 6) consists of an MKSU, power supply and up to 16 electronic key telephones (EKTs). All connections between the MKSU and the EKTs are made via a customer-provided main distribution frame (or MDF). Using modular line cords, the CO lines are then connected between the MCOU PCBs and the telephone company-provided RJ-25 jacks. An external tuner (or equivalent) is required if the music-on-hold feature is utilized.

02.02 A functional block diagram of the STRATA VI MKSU is shown in Figure 7; it consists of station interfaces (MSTU), which include a solid-state space division matrix; CO line interfaces (MCOU) and central control equipment (MTOU and MCCU).

MKSU

GREEN
JUMPER
WIRE

115 VAC

POWER
SUPPLY

3-WIRE CABLE

RJ-25

1-3

TO CO

4-6

FM
TUNER

MDF #1

MDF #2

10-17

18-25

EXTERNAL
SPEAKER

2-PAIR

2-PAIR

2-PAIR

2-PAIR

EKT

EKT

EKT

EKT
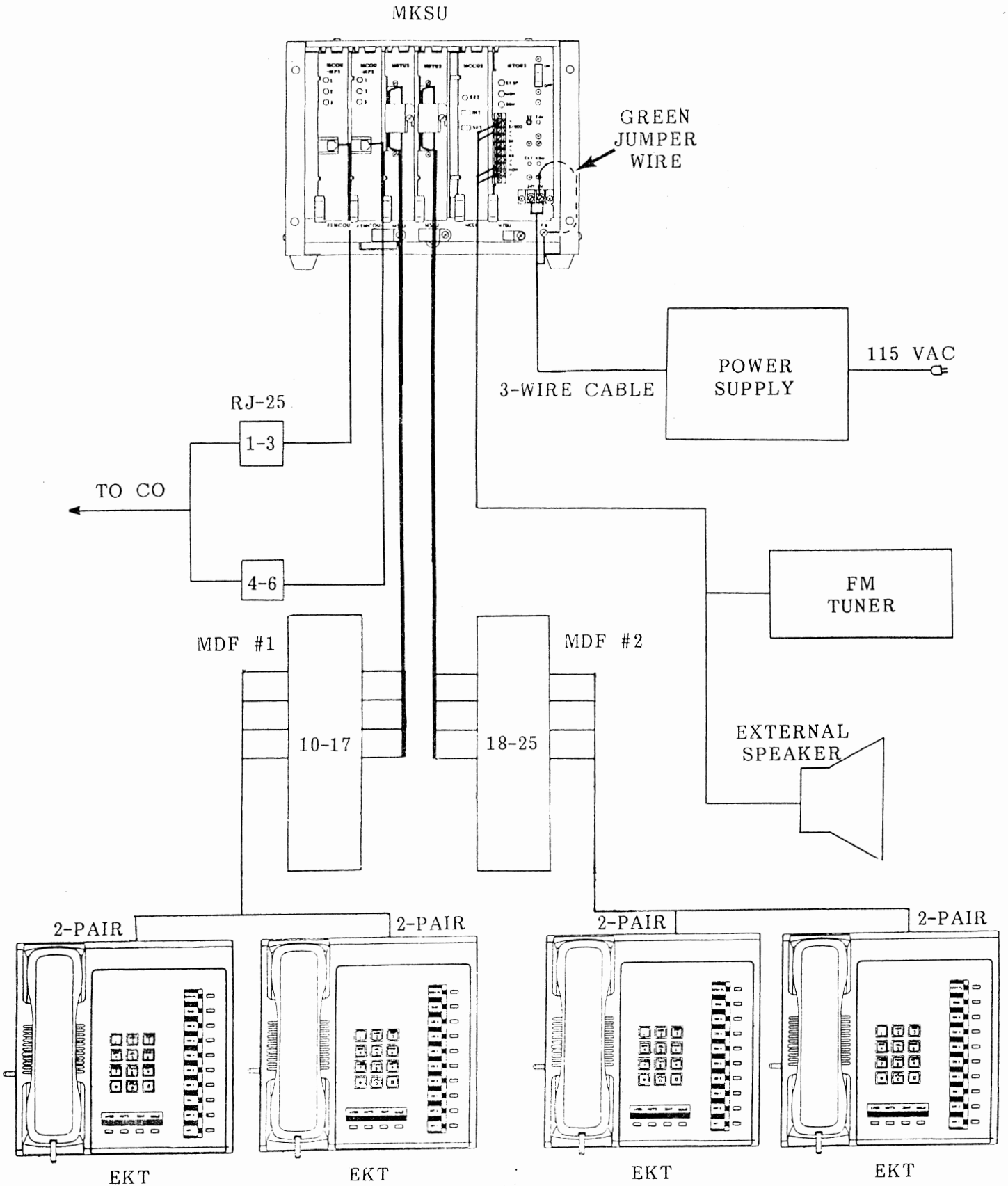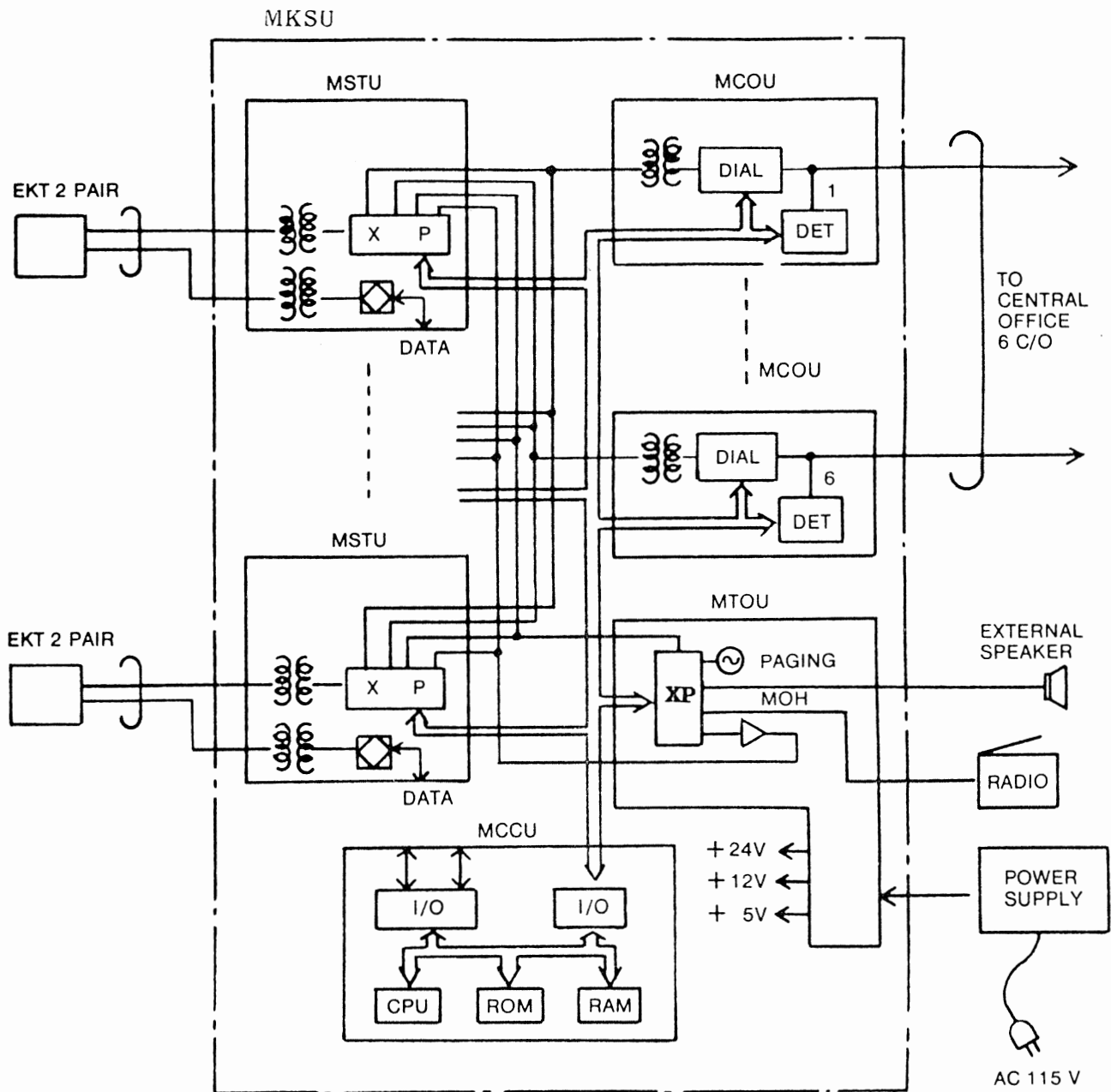
FIGURE 6

FIGURE 7

02.03 Connections between the station voice lines and the CO lines are via the switching matrix provided on the MSTU PCBs. A similar matrix is provided on the MTOU for intercom connections, paging connections and for the distribution of the various system tones (Dial, Busy, etc.).

02.04 The system is entirely under the control of a single-chip microprocessor, which is located, along with the system program and data memories, on the MCCU PCB.

03 SYSTEM CONFIGURATION

03.01 Key Service Unit

03.02 The MKSU arrangement illust-

rated in Figure 8 shows the location of the various PCBs. All PCBs slide in from the front of the cabinet, and, although the rear panel of the MKSU is removable, rear access is not required.

FIGURE 8

03.03 Complete with all options, the MKSU utilizes seven circuit boards. The names and functions of the PCBs are:

- MCOU (MF or DP)—an interface between the MKSU and the public telephone network or PBX lines. Ring detection, hold and dial outpulsing for three circuits are performed by this PCB. D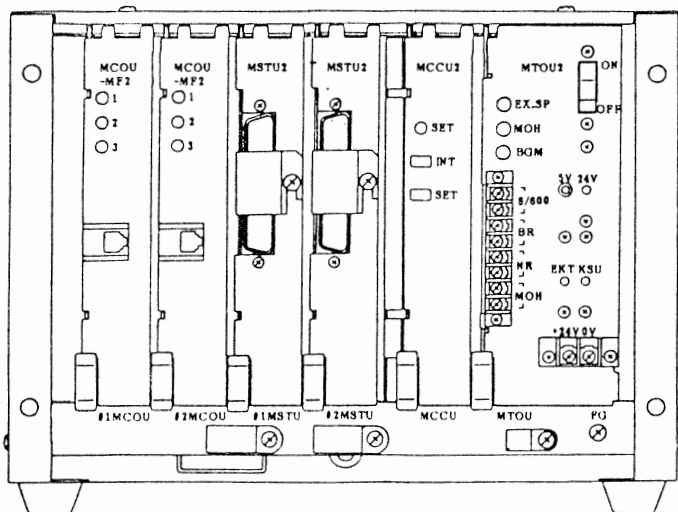epending upon local CO requirements, an MF or DP type of MCOU will be provided (MF for DTMF outpulsing; DP for rotary dial outpulsing). Each MCOU PCB serves up to three CO/PBX lines.

- MSTU—an interface between the MKSU and EKTs, which includes the solid-state space division matrix used for voice connections between the EKTs and the CO/PBX lines. Each MSTU PCB serves up to eight EKTs. Two-pair wiring is required for each EKT; one pair carrying voice and the other pair carrying data to and from the EKT.

- MCCU—all system control functions are performed by the single-chip microprocessor located on the MCCU. The system program stored in ROM, the RAM for system operations, and the battery-protected RAM for system data storage are also located on this circuit board.

- CRDU—this optional PCB mounts directly on the MCCU to provide the additional memory capacity required for the Automatic Dialing-Station feature. The additional RAM capacity is battery-protected.

- MTOU—performs a number of miscellaneous system functions:
  - Generates system tones.
  - Provides the switching matrix for the delivery of tones for both paging and intercom connections.
  - Houses the external page amplifier.
  - Houses circuitry and connection points for the relay service and music-on-hold.
  - Provides connection points for the 24 VDC input power.
  - Houses the voltage regulators that provide 12 and 5 VDC for system operation.
  - Houses three circuit breakers, one each protecting the 24VDC, EKT, and KSU circuits.

03.10 Power Supply Assembly

03.11 The separate power supply is a fixed unit complete with a wall mounting bracket. Attachment to a wall or other fixed surface is via two 1/4-inch toggle bolts or screws. The unit can accommodate "brown out" conditions or high voltages within a range of 90 ~ 130VAC, 60 Hz. A 10-ft. AC power cord allows flexibility in placing the power supply during installation.

03.12 Two power supplies are available:

- MPSA-200 provides sufficient power for 16 stations, of which a maximum of three telephones may be BLF EKTs.

- The EPSA-104 is necessary if four or more BLF EKTs are required within a system. Up to 16 BLF EKTs may be installed with an EPSA-104 Power Supply.

03.13 Optional battery back-up units (PBBU) are available for both power supplies. The PBBU is a printed circuit board that mounts inside the power supply housing. The recommended battery pack, which is customer supplied, consists of two 12VDC batteries (maintenance-free automobile-type is recommended). With the optional battery back-up assembly installed, all functions of the STRATA VI system will operate for a period of time (which is in direct ratio with the type and size of batteries selected) after a loss of normal electrical power. No calls will be disconnected during switch-over to battery power.

03.20 Station Equipment

03.21 The principal components of the STRATA VI electronic key telephone are: handset, dial pad, speaker, ringing volume control, speakerphone volume control, 2 intercom keys, 6 CO/PBX line keys and 6 feature keys. LED indicators are provided for intercom lines, CO/PBX lines, speakerphone, and MW/FL and DND keys—HOLD, CONF and MUTE keys have no LEDs.

03.22 Standard features of the STRATA VI EKT include full speakerphone capability, handsfree talk-back, modular handset cord and modular line cord.

03.23 The optional BLF EKT (Figure

4) has an LED panel showing the busy/idle status of each station. A station in the DND mode will show as busy.

03.24 The 20-key executive EKT (Figure 5) features, in addition to those of the standard EKT, include the following:

- Seven keys (AD 1 ∼ 7) for one-key automatic-dialing.

- Automatic-dialing access (REP).

- Redialing of last number dialed by pressing one key (RDL).

- A pause key for "behind PBX" use (PAU).

03.25 All three types of EKTs are easily converted for wall mounting with an optional handset hanger kit.

03.30 Installation

03.31 The STRATA VI MKSU is arranged at the factory for table-top mounting, but a simple reversal of the back panel quickly converts it for wall mounting.

03.32 All connections to the MKSU are made via the faceplates of the various printed circuit boards.

- CO/PBX line connections are made to the front of each MCOU using a 3-pair modular cord for each card.

- Each group of eight EKTs is connected to the front of each MSTU with one standard 50-pin amphenol-type connector.

- Screw terminal barrier strips are mounted on the front of the MTOU to provide attachment points for the following connections:

    24VDC power input

Music-on-hold source input
External page output
Night relay service
External page relay service

03.33 The power supply is mounted to the wall separately from the MKSU and connected to the 24VDC input on the MTOU PCB.

03.40 Maintenance

03.41 Faults in the STRATA VI are repaired by replacing any faulty component (i.e., printed circuit board, subassembly, station set, etc.) and returning it to the manufacturer for repair.

04 FEATURES AND OPERATION

04.01 General

04.02 This section contains brief descriptions of the STRATA VI features listed earlier in Tables B and C and some associated operating instructions. Detailed operating instructions can be found in either the STRATA VI **USER GUIDE** or Section 100-006-400, Opera-ting Procedures.

04.10 Standard Features

04.11 System

- All Call Voice Page—dialing a one digit access code permits a station user to page via all EKT speakers simultaneously. The system can also be programmed to include the External Page feature in an All Call Page.

- Alternate Point Answer—CO/PBX or intercom calls can be answered from any station.

- Automatic Dialing-System—this standard feature allows 24 numbers to be stored in the system memory. After selecting an outgoing line,

any station user can cause one of the stored numbers to be outpulsed by dialing the proper access code.

- Automatic Hold Recall--a CO line placed on hold by any station will recall that station after a programmable period of time.

- Automatic Privacy With Release--privacy is automatic on all connections. Operation of the CONF key allows another station to enter the conversation.

- Automatic Release From Hold—the system automatically releases held CO lines if a disconnect signal is received from the central office.

- Background Music With Station Control—music from the music-on-hold source can, at the station user's option, be heard via the EKT speaker. The same music may also be broadcast via the external page interface if an external speaker is installed.

- Busy Override—after dialing a busy station and receiving a busy tone, the caller can dial a "2" and cause a tone burst to be sounded via the called EKT's speaker.

- Conference (Multi-station)—conferencing is permitted to a maximum of four stations and one CO or intercom line.

- Conference (Multi-trunk)--conferencing of two CO lines and three stations is permitted.

- Distinctive Ringing—CO line and intercom calls are distinguished by different ringing tones.

- DTMF and Dial Pulse Compatible--DTMF or dial pulse signalling can be sent to the CO/PBX line by installing the proper type of MCOU.

● External Page Interface—dialing a 1-digit code permits a station user access to a customer-provided external speaker via an internal 3-watt amplifier. As an option, a 2-way, 600-ohm voice path is available for use with a customer-supplied talk-back speaker/amplifier.

● Flash Key (PBX Transfer or CO Dial Tone Recall)—all EKTs are equipped with a Message Waiting/ Flash (MW/FL) key which, when operated while connected to a CO/ PBX line, causes a timed "flash" to be transmitted to the CO or PBX. The timing of the flash can be programmed to signal a PBX for feature operation or can be long enough to cause a disconnect and dial tone recall on a CO line. Also see Message Waiting.

● Flexible Line Ringing Assignment—a programmable ring or no ring option is provided for each line selectively by each station. Each line may be programmed to ring a maximum of eight stations.

● Live System Programming—live system programming is accomplished without service interuption to other station users by placing the system in the special programming mode and inputting data via Ext. 17. Ext. 17 is the only station that is "down" during programming.

● Message Waiting—the designated Message Center can indicate a message is waiting for any station with the Message Waiting LED of that station. The called station cancels the LED by lifting the handset and operating the MW/FL key. Also see Flash Key.

● Multiple Simultaneous Handsfree Intercom Paths—both intercom lines are able to carry handsfree conversations simultaneously.

● Music-on-hold Interface—an interface is included for a customer-provided music source. CO lines placed on hold will be connected to this source. In addition, this music may also be broadcast from EKT speakers and external page when the background music options are selected.

● Night Ringing Over External Page—as a programmable option, while the night mode is active, a system-generated ring tone will be transmitted via the external speaker whenever any line rings.

● Night Transfer of Ringing—CO lines can be programmed to ring different stations while in the "Day" or in the "Night" mode. If this feature is to be used, the DND (Do Not Disturb) key on Ext. 10 is reassigned to the **NT** function and is then used to select the "Day" or "Night" mode.

● Non-blocking Dialing—dialing is permitted on all CO and INT lines simultaneously.

● Outgoing Call Restriction—any station can be selectively restricted from originating calls on any or all CO lines. However, the station will still receive calls on the restricted line(s).

● PBX Compatible—STRATA VI features, such as toll restriction and automatic dialing, are compatible with PBX operation.

● Private CO Lines—restrictions may be programmed into the system so that selected CO line(s) may appear only on selected station(s).

● Repeat Last Number Dialed—the last number dialed by each station is always stored by the system and will be dialed automatically when-

ever the station user selects an outgoing line and depresses the "#" key.

- Toll Restriction—selectively programmed on a per-station, per-line basis. STRATA VI performs toll restriction by rejecting the numbers "0" and "1" as the first or second digit and limiting the total number of digits dialed to seven or eight.

- Voice or Tone Signalling—a programmable system feature that optionally selects either tone ringing or voice page as the primary method of intercom call signalling. The calling station, however, may choose the alternate method by dialing "1" following the extension number.

- Wall Mountable MKSU—the MKSU is shipped configured for table mounting. Rotating the back cover 180° converts the MKSU to wall mounting.

04.12 Station

- Do Not Disturb—this feature is activated and deactivated by alternate depressions of the DND key. A station calling a station that is in the DND mode will receive a fast busy tone.

- Do Not Disturb Override—after reaching a DND station, that station may be advised that a call is waiting by dialing "2". A tone signal will be heard at the DND station.

- Executive Override of Privacy—a station that is programmed for this feature will override the automatic privacy feature and is able to enter any existing conversation. A warning tone, however, is inserted before the overriding station is actually connected. A maximum of

two stations can be programmed for executive override.

- Handsfree Talk-back—all EKTs are equipped for handsfree talk-back on voice-announced intercom calls as a standard feature.

- I-called Illumination—a distinctive flash appears on the Intercom LED at the EKT that is actually being called. All other EKTs see the normal incoming call flash rate.

- I-hold Illumination—the EKT user is given a distinctive LED flash to indicate a line actually placed on hold at that EKT. All other stations see a normal hold flash.

- I-use Illumination—a distinctive flash rate shows the line presently in use at a given EKT. Other stations see a steadily illuminated LED for that line.

- Modular Handset and Line Cords—all EKTs are equipped with modular handset and line cords.

- Mute Key—all EKTs have a MUTE key that may be used to cut off the microphone when the speakerphone is in use, thereby permitting a private local conversation.

- On-hook Dialing—STRATA VI lets you dial your calls with the handset still on-hook. Call progress can be heard via the telephone speaker; no need to pick up the handset until your party answers.

- Push-Button Dialing—all STRATA VI EKTs are equipped with push-button dial pads.

- Ringing Line Preference—a line ringing at a station can be answered by merely lifting the handset or depressing the "SPKR" key. The ringing line will be automatically selected.

● Speakerphone—all EKTs are fully functional speakerphones.

04.20 Optional Features

● Automatic Dialing-Station—adding a CRDU PCB to the MCCU increases the STRATA VI automatic dialing capabilities. This feature encompasses a 40-number system list (increased from 24 numbers) and a private 40-number station list for each station.

● Busy Lamp Field—an LED panel showing the busy/idle status of each station. A station in the DND mode will show as busy.

● Relay Service—when the optional relays are equipped on the MTOU PCB, the following signals are provided for external equipment.

  ● External Page—the relay is activated whenever the external page circuit is accessed. A "make" contact is provided for control of background music.

  ● Night Relay Service—the optional NR relay will provide a dry contact at the NR terminals on the front of the MTOU PCB. A strap option on the MTOU allows the NR relay to function in one of two modes.

    a) Answering Machine Control— if the strap remains intact, the relay is operated continuously when the system is in night service. This mode is intended for indirect control of an answering machine.

    b) Night Bell Control—if the strap is cut, the relay pulses at a 1-sec. on, 3-sec. off rate whenever the system is in night transfer mode and an incoming call is ringing

the system. This mode is intended to be used for indirect control of an external night bell.

● System Battery Back-up—an optional PCB can be plugged into the STRATA VI power supply to provide automatic switching to standby battery power. During normal power conditions the batteries are kept fully charged by the power supply.

● 20-key executive EKT—an optional executive unit provides, via 10 additional feature keys, automatic-dialing access, seven one-key automatic-dialing telephone numbers, redial last number dialed, and a pause key.

● Wall Mounting—the STRATA VI EKT is easily converted for wall mounting with an optional handset hanger kit.